

UK Patent Application GB 2 147 773 A

(43) Application published 15 May 1985

(21) Application No 8423030

(22) Date of filing 12 Sep 1984

(30) Priority data

(31) 532489 (32) 14 Sep 1983 (33) US

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(51) INT CL⁴
A63F 9/22 G06F 3/153 G06K 11/06

(52) Domestic classification
H4T 4R BRA
G4H 13D 14A 14B 14D 1A TE

(56) Documents cited
None

(58) Field of search
H4T

(54) Lottery game terminal

(57) A lottery game terminal (10) providing a plurality of user selected lottery games is capable of operating in a multiterminal statewide lottery game system. Choice of game and game play is controlled by player manipulation of a light pen (13) to operate any of several soft switches displayed on a game terminal monitor (20). Game play at any time is defined by a plurality of fixed game states. As game play progresses, the game architecture allows the game to move from state to state.

Accordingly, a high measure of security is provided by a predictable flow of game control. The game may be accompanied by audible tones, and a meter may be provided for storing an audit transaction. When a winner is declared, a game payout schedule may be displayed.

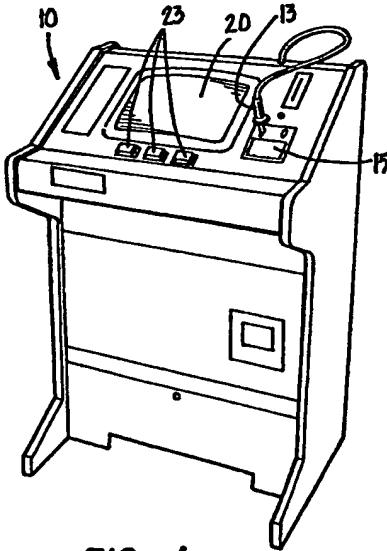


FIG. I.

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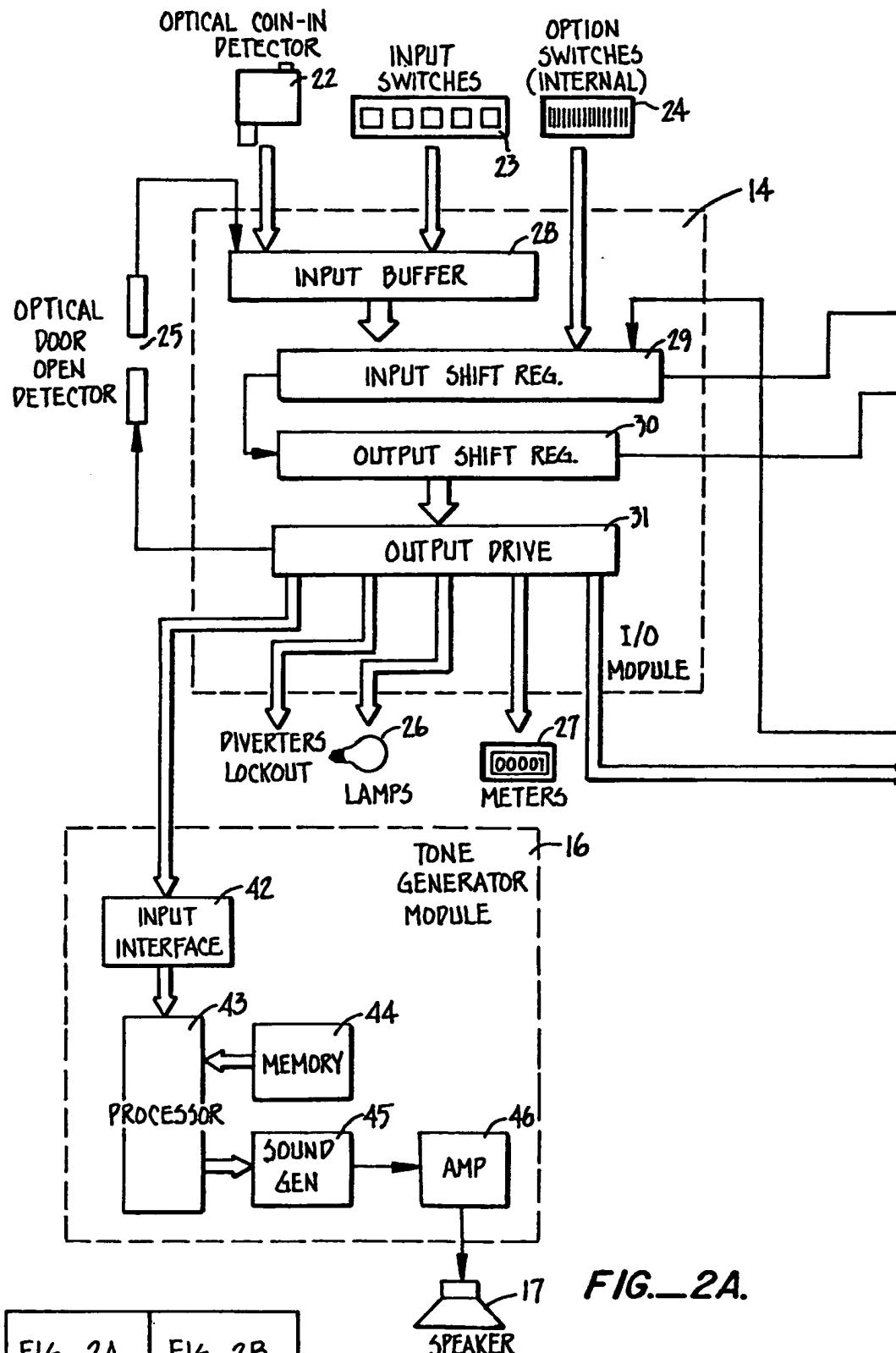


FIG. 2A.	FIG. 2B.
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FIG. 2.

FIG. 2A.

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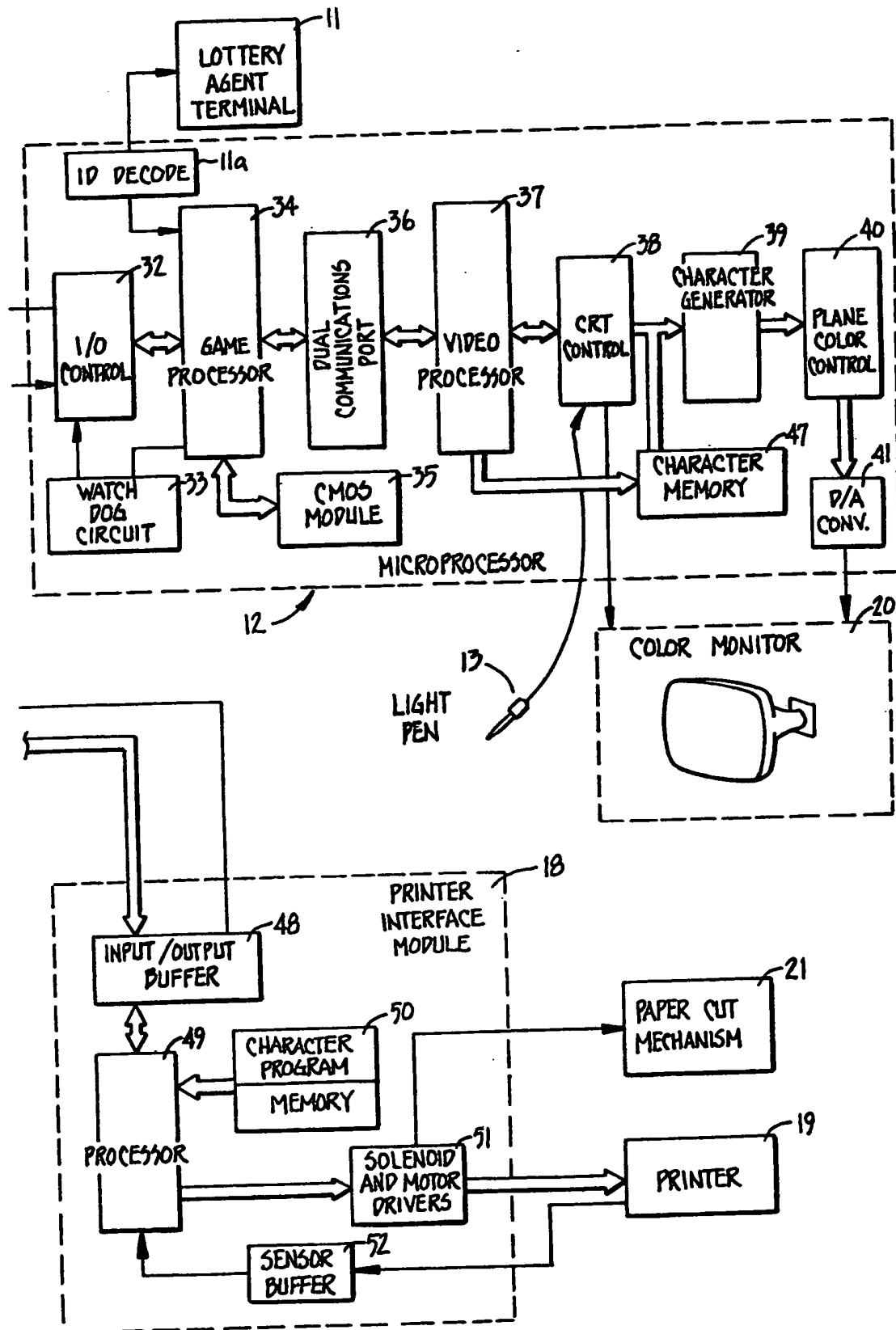


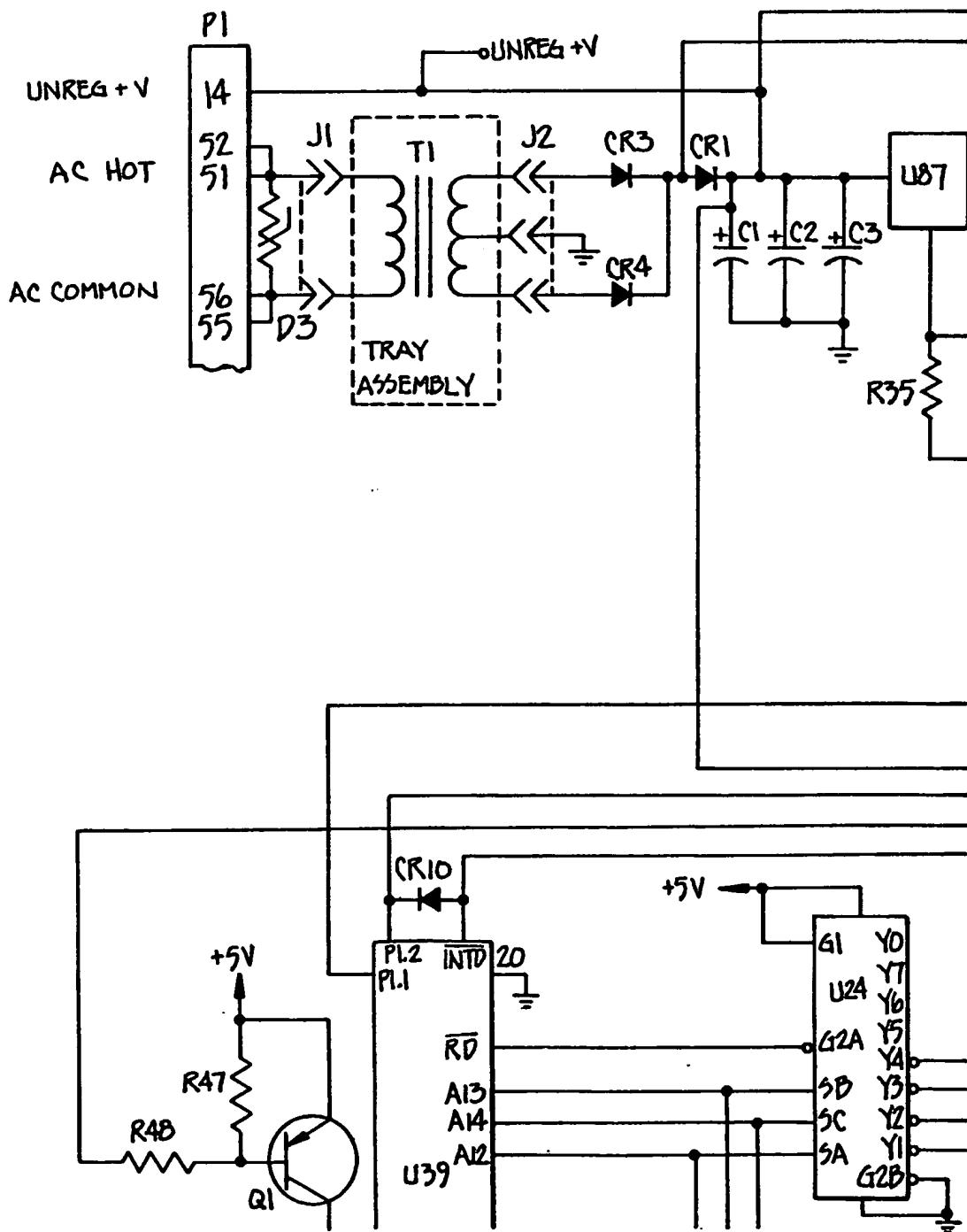
FIG. 2B.

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FIG.—3A.	FIG.—3B.	FIG.—3C.	FIG.—3D.
FIG.—3E.	FIG.—3F.	FIG.—3G.	FIG.—3H.

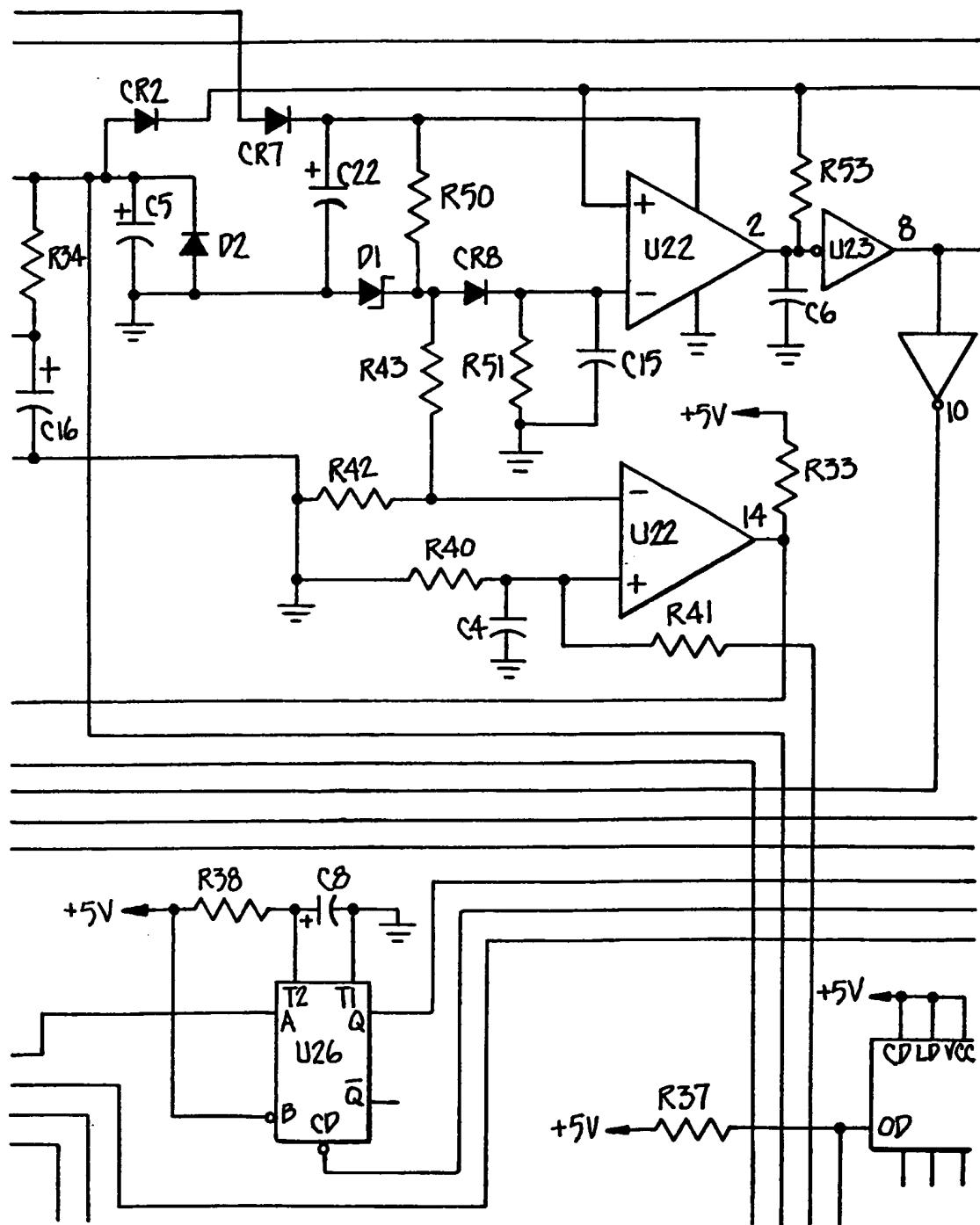
FIG.—3.

FIG.—3A.



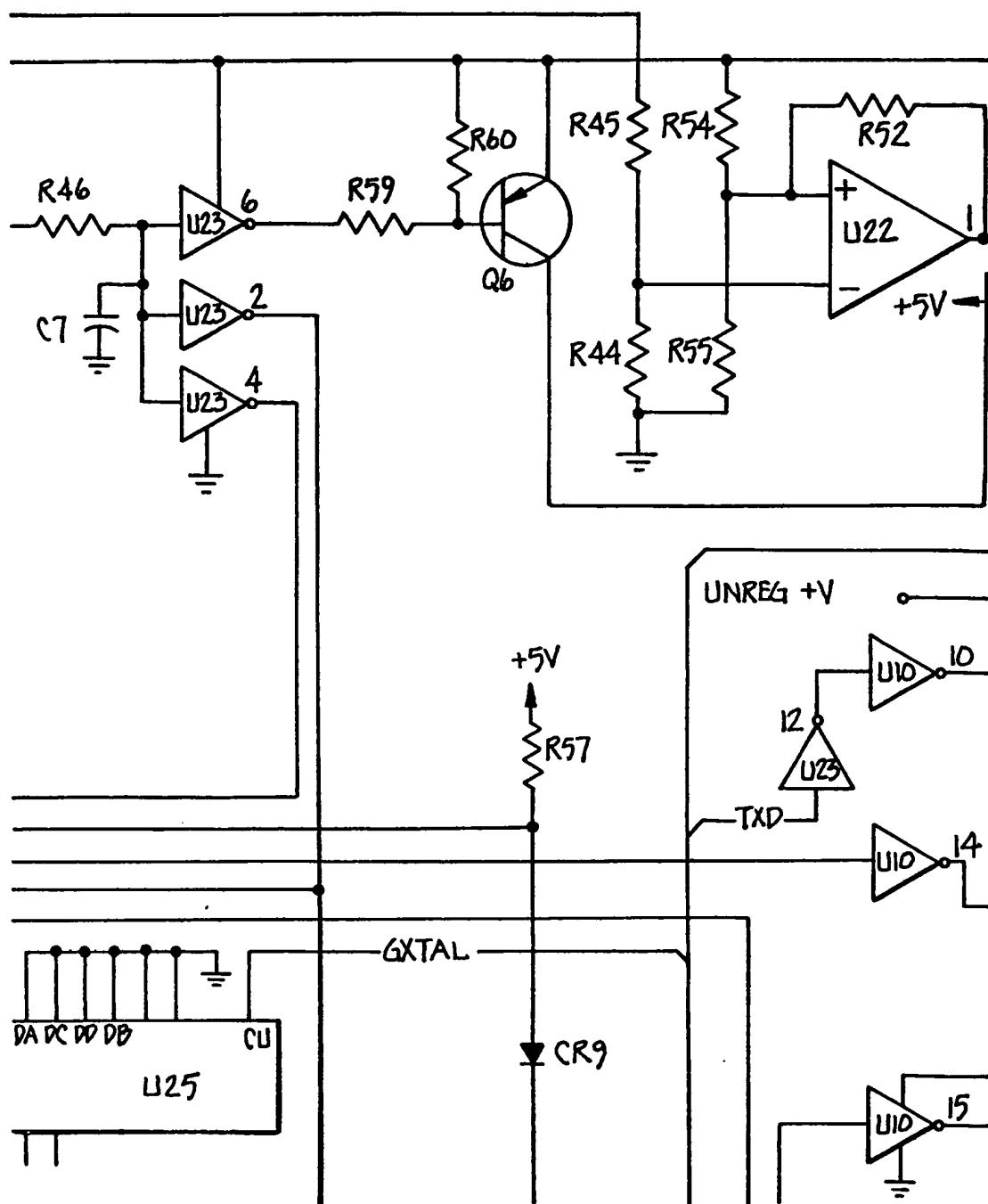
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FIG.—3B.



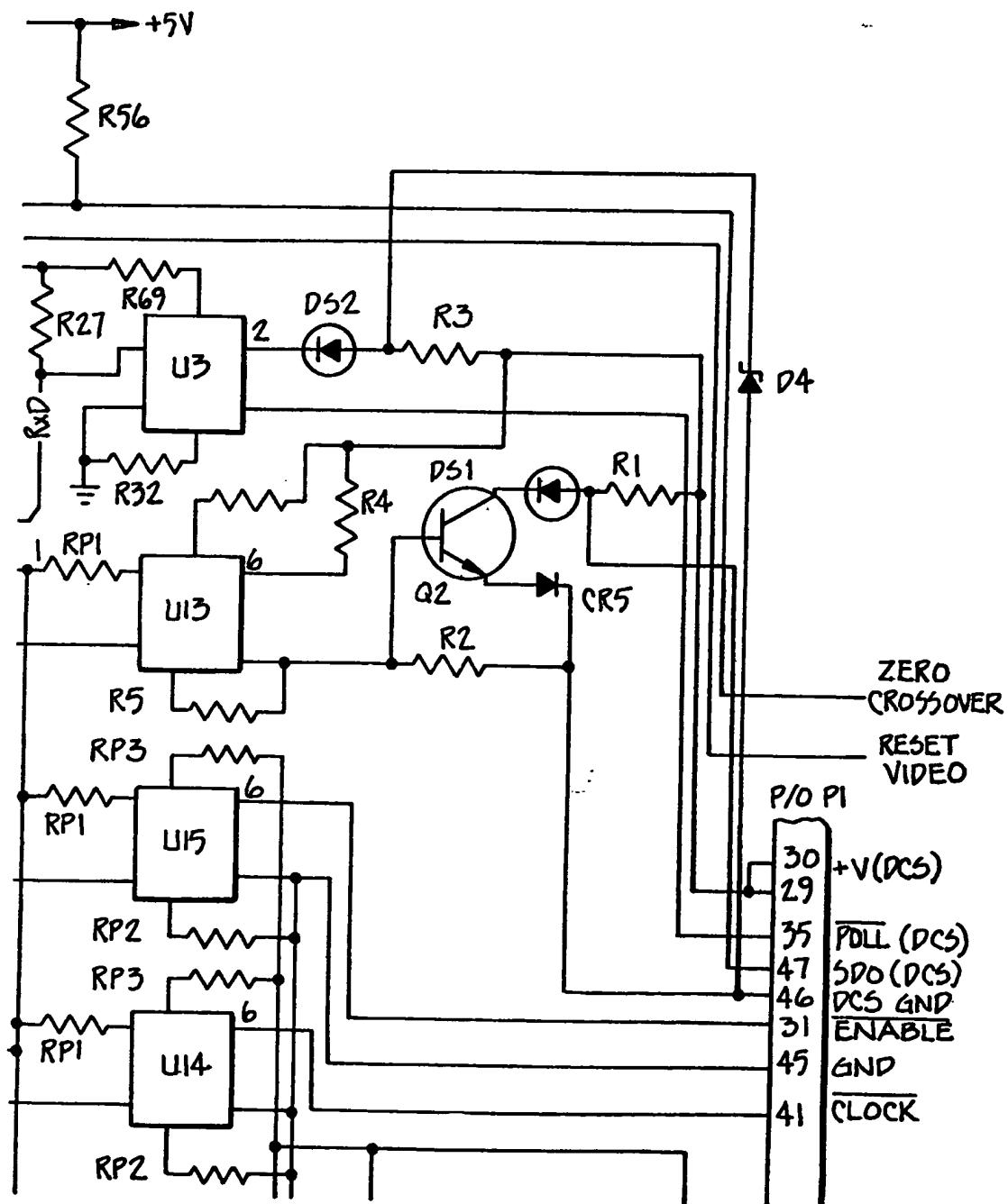
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FIG. 3C.



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FIG. 3D.



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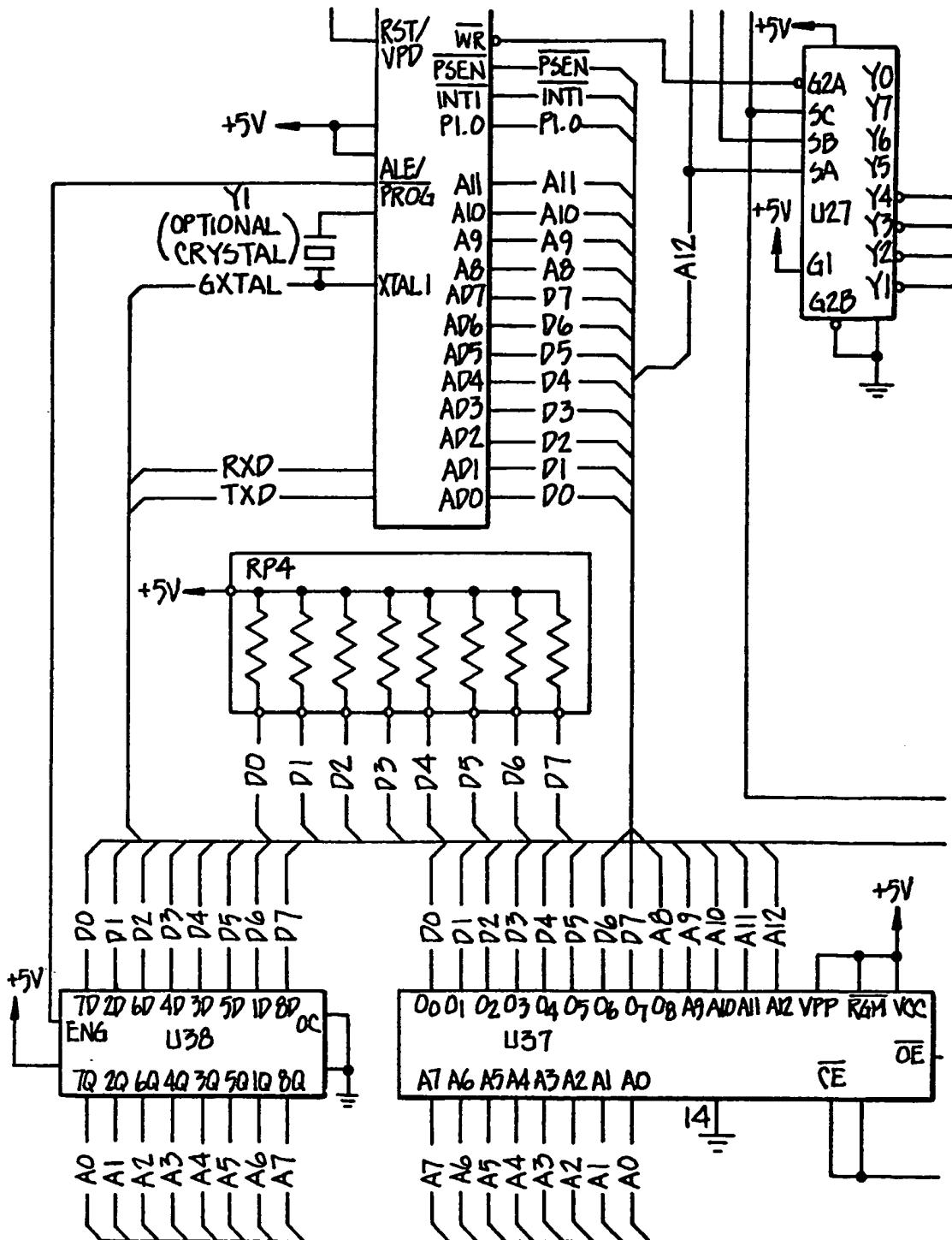


FIG. 3E.

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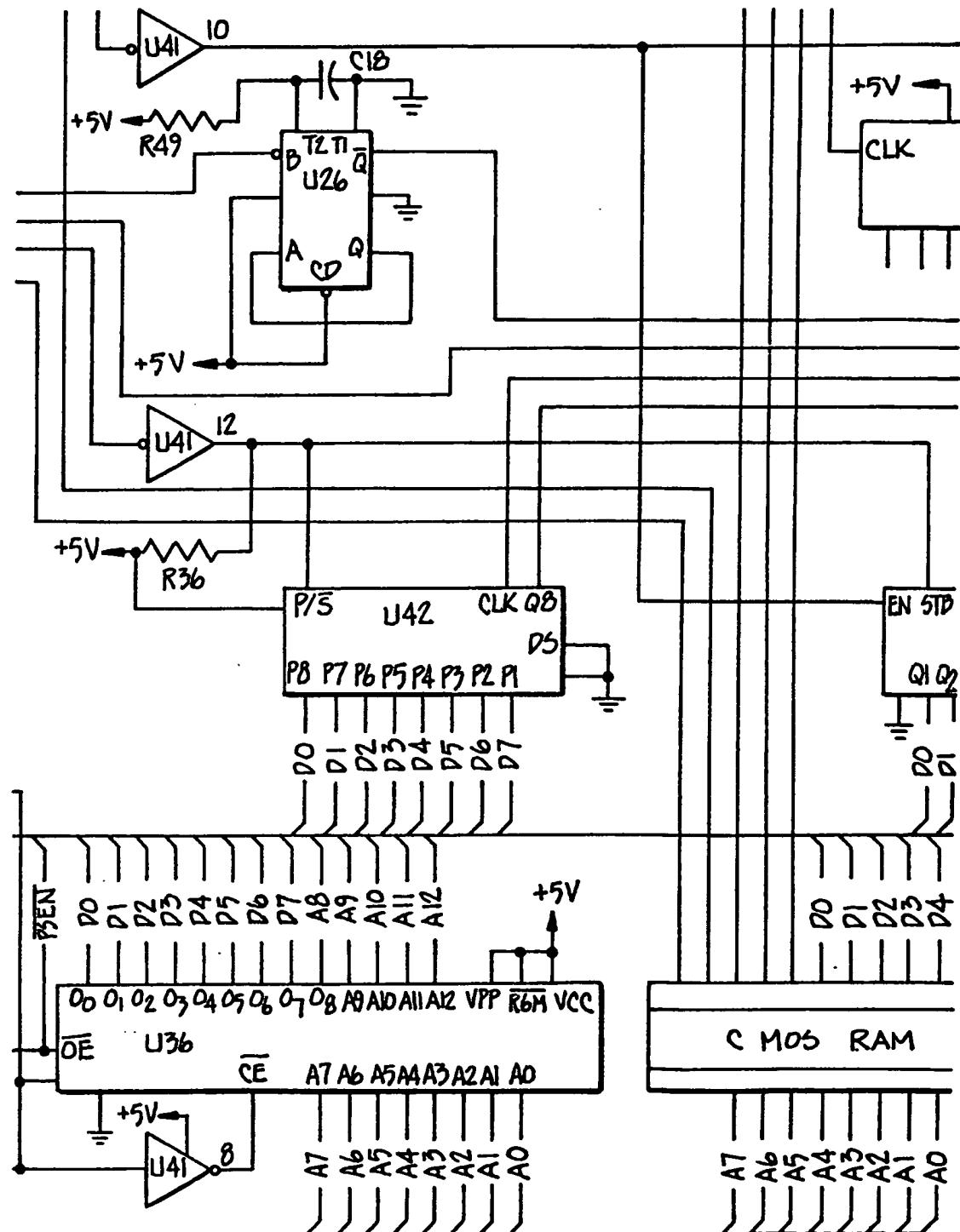


FIG. 3F.

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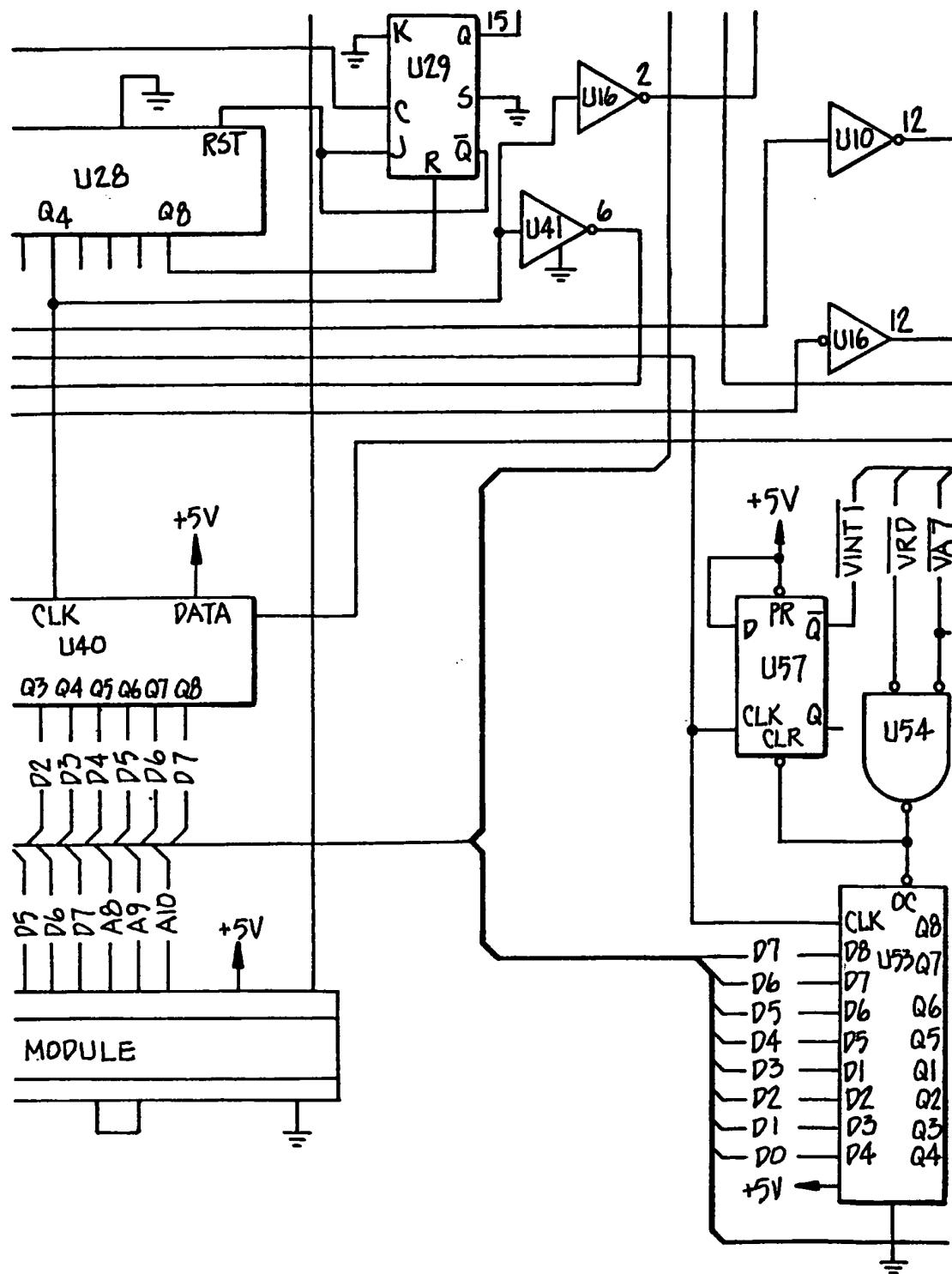


FIG. 3G.

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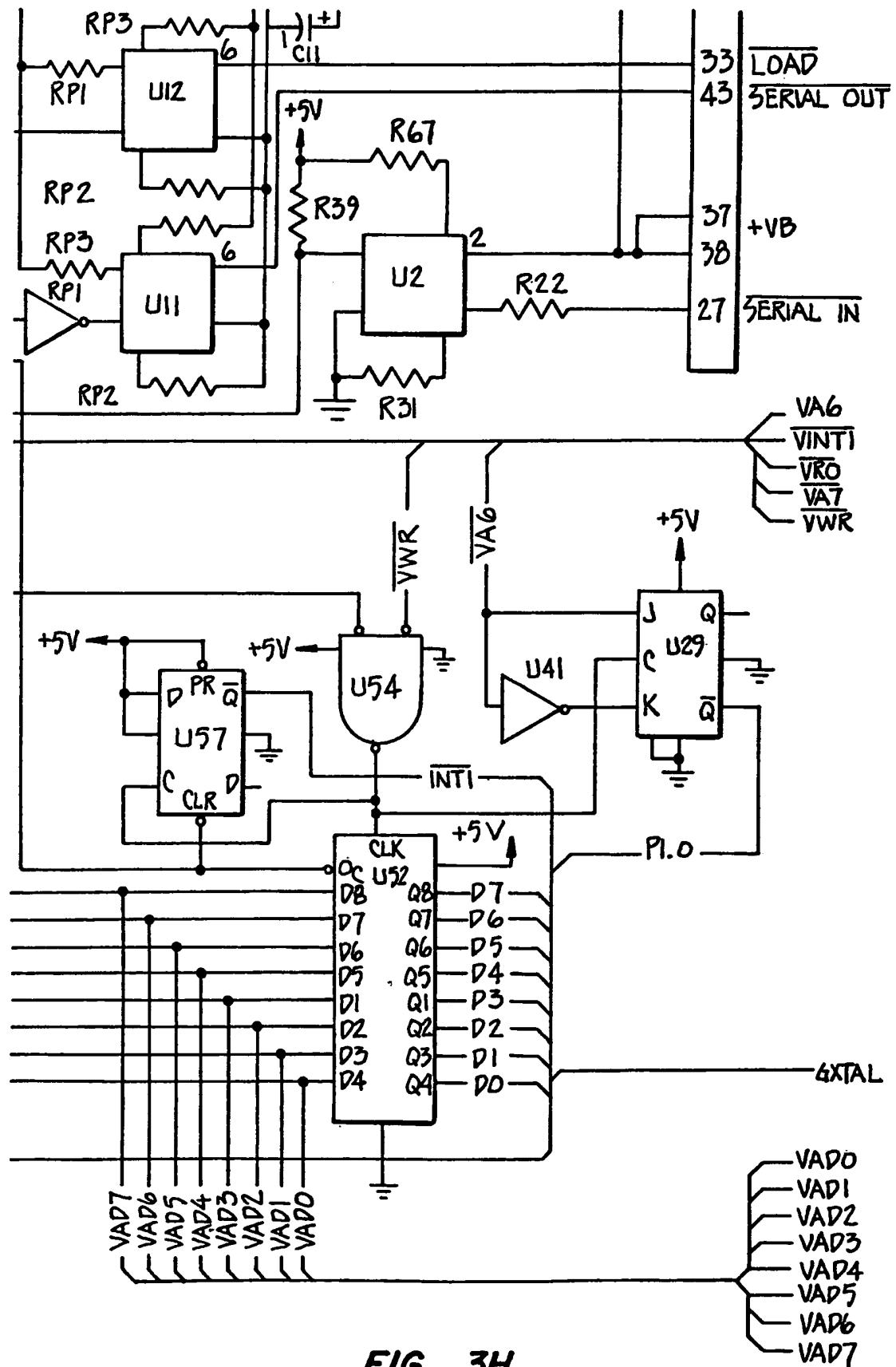


FIG. 3H.

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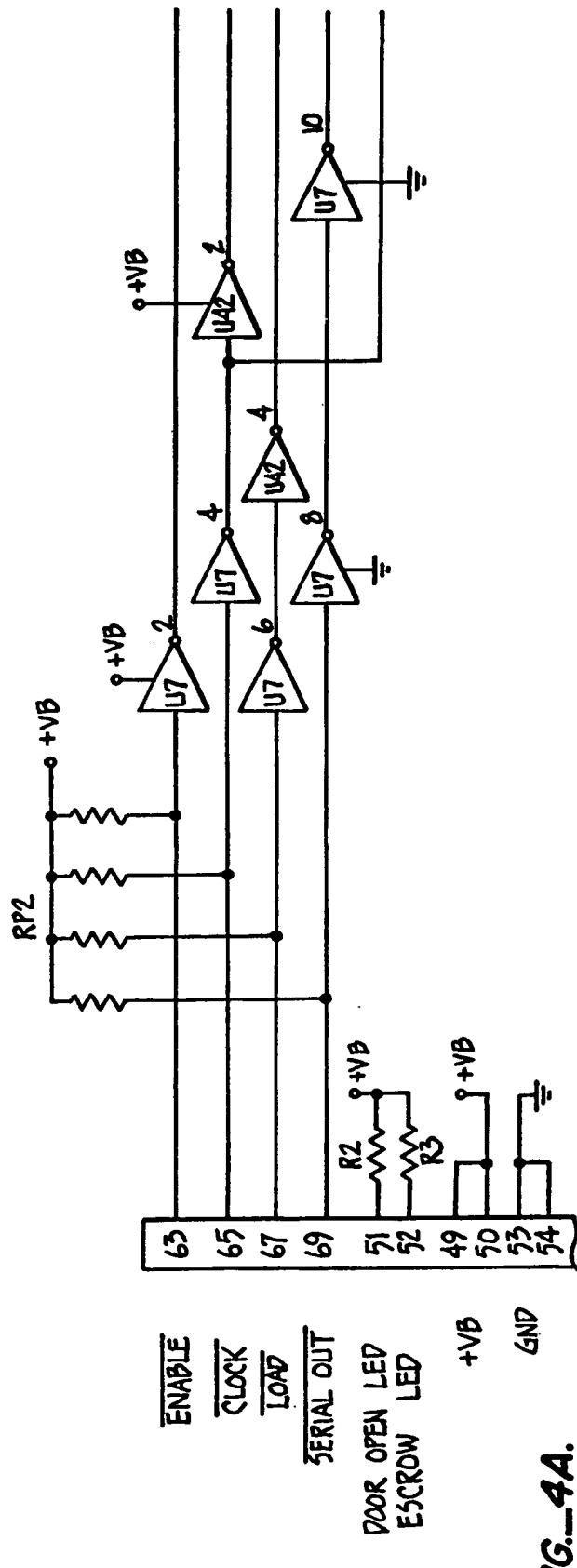
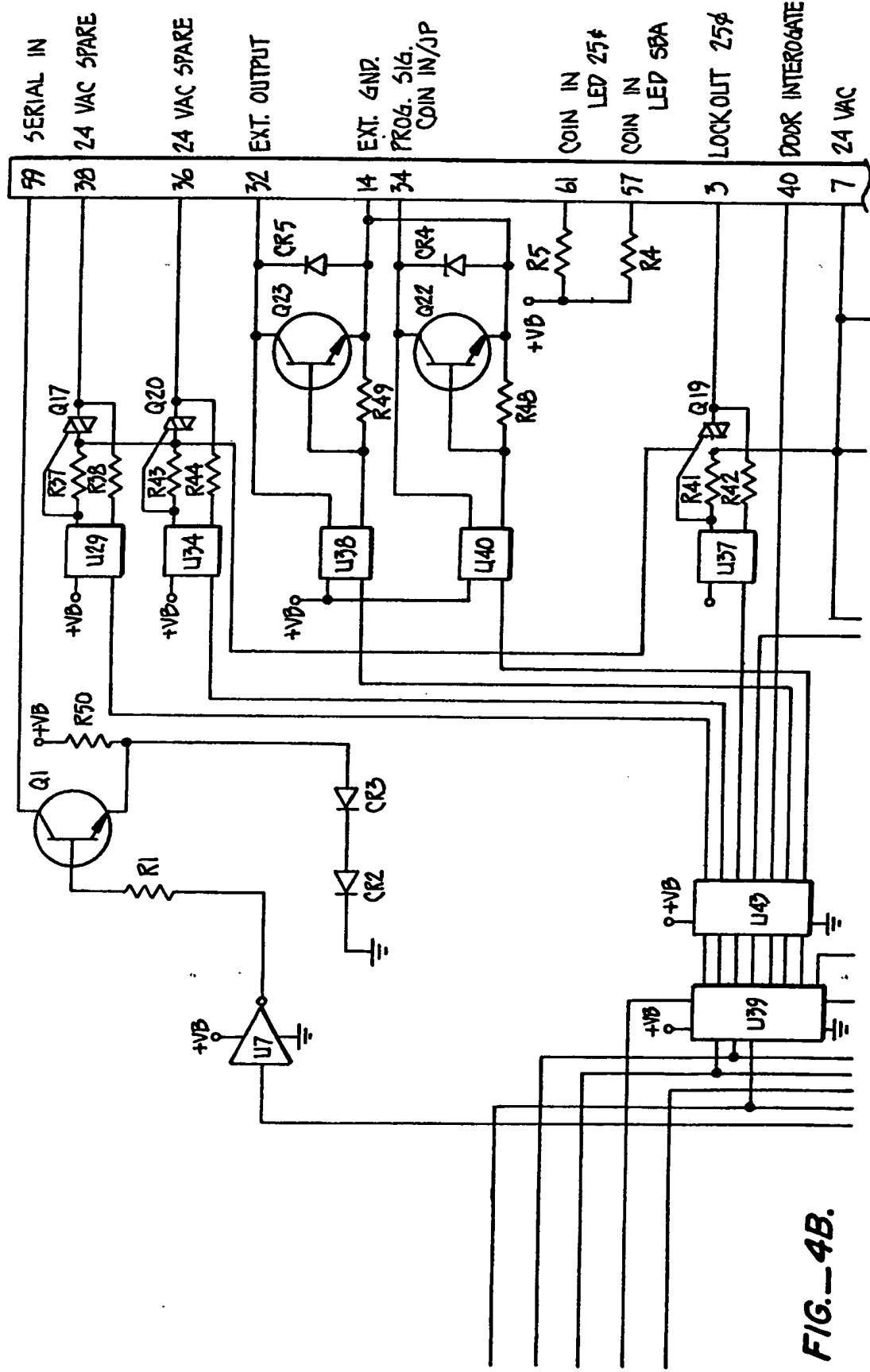


FIG.—4.

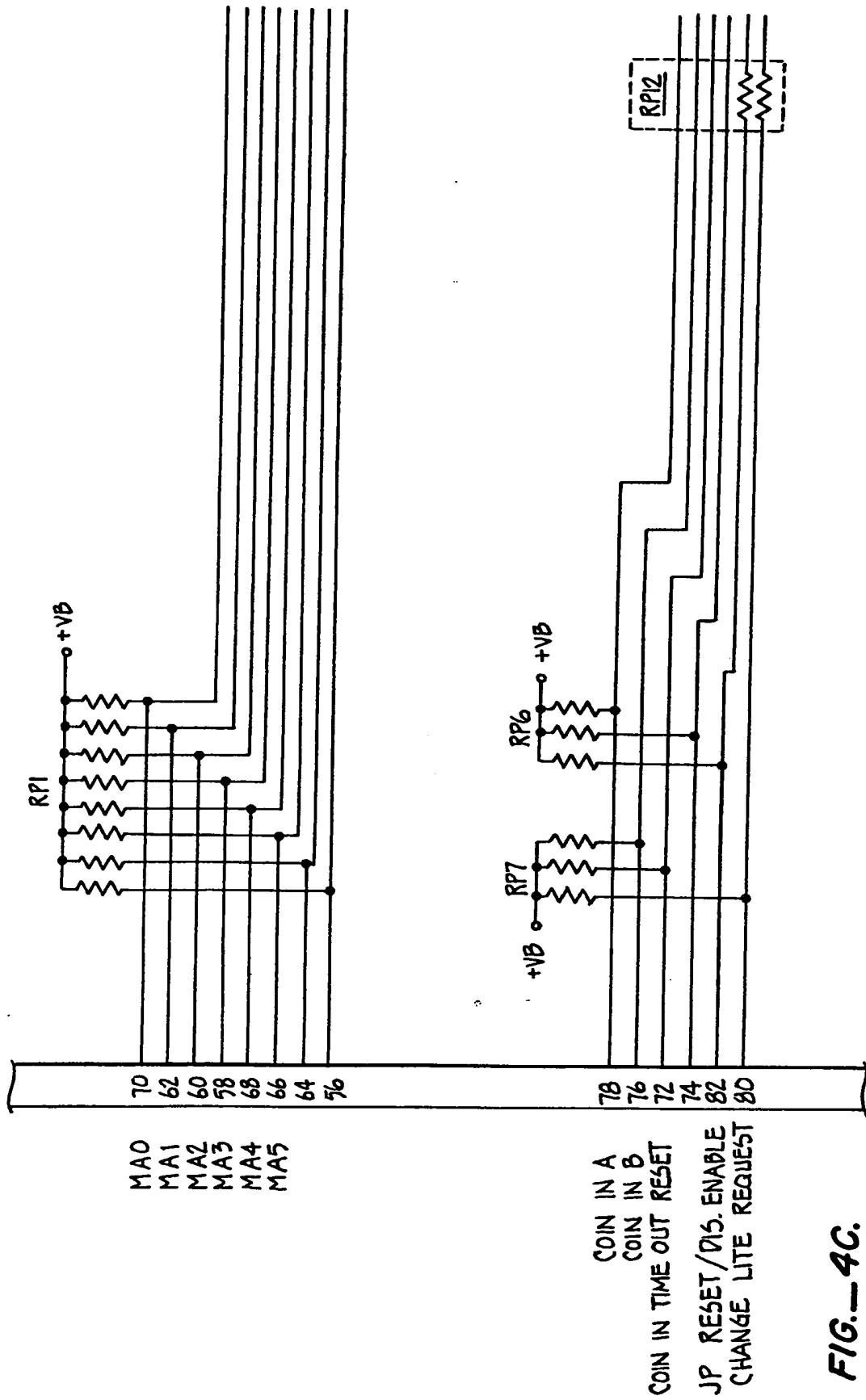
FIG. 4A.	FIG. 4B.
FIG. 4C.	FIG. 4D.
FIG. 4E.	FIG. 4F.

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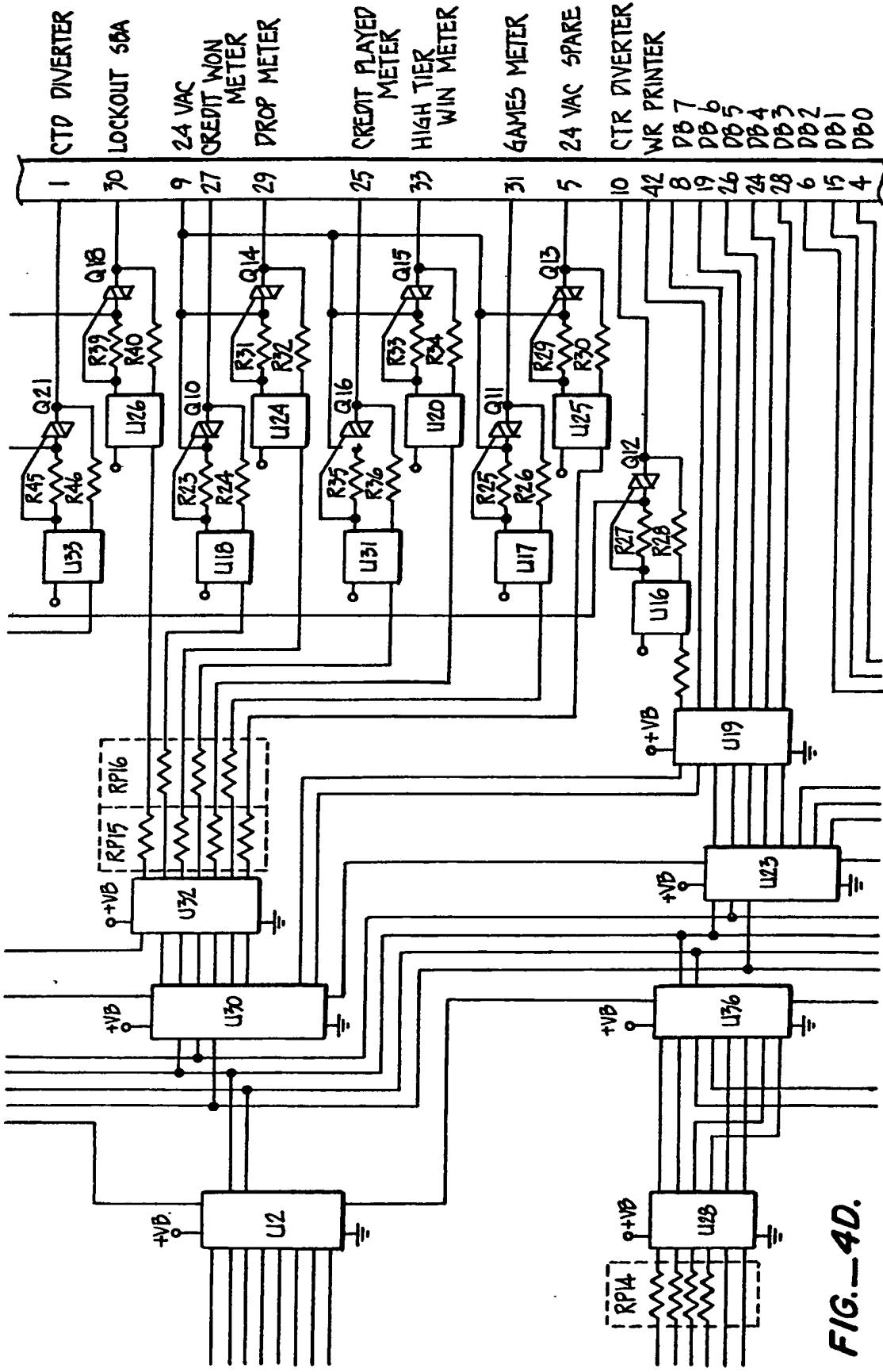


F/G.-4B.

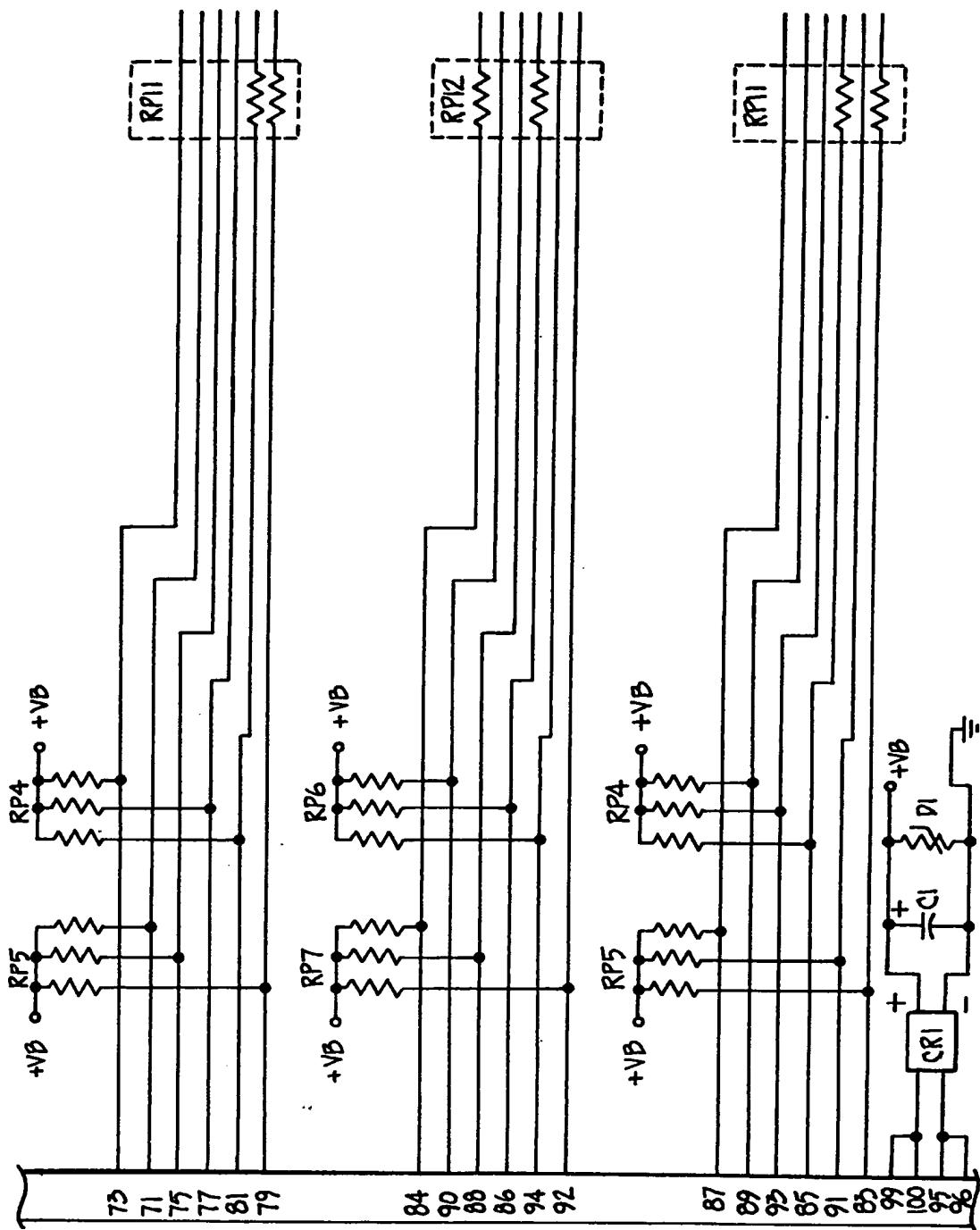
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COIN REJECT SENSE

SELF TEST

COIN RETURN

PLAY CREDIT

CASH OUT

COIN IN C
DOOR OPEN / RECEIVE
PAPER LOW
PRINTER BUSY
PRINTER ERROR

NEUTRAL SW
L PEN
COIN IN D
COIN IN E
COIN IN F
START SW

F/G.—4E.
8VAC

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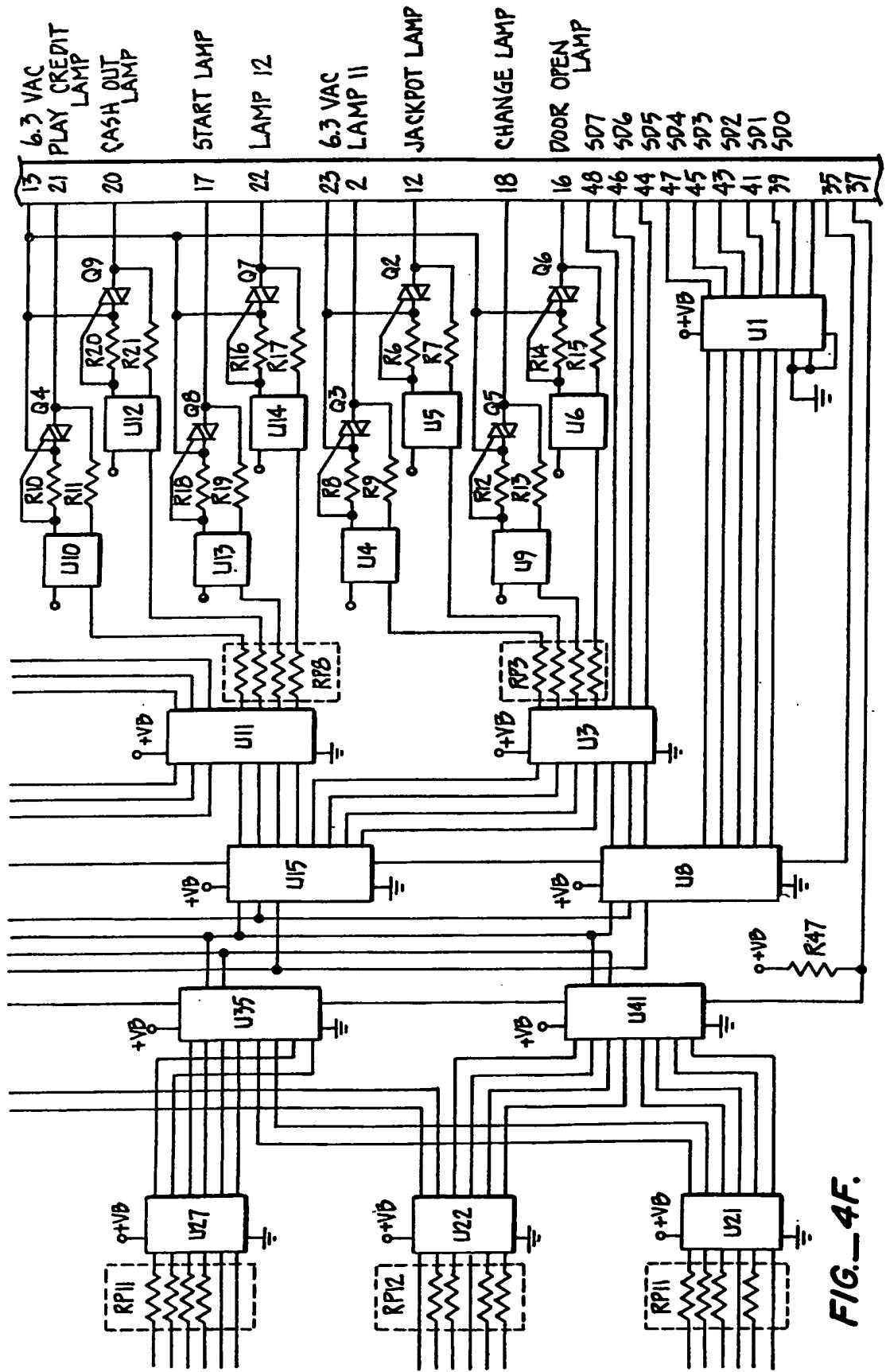
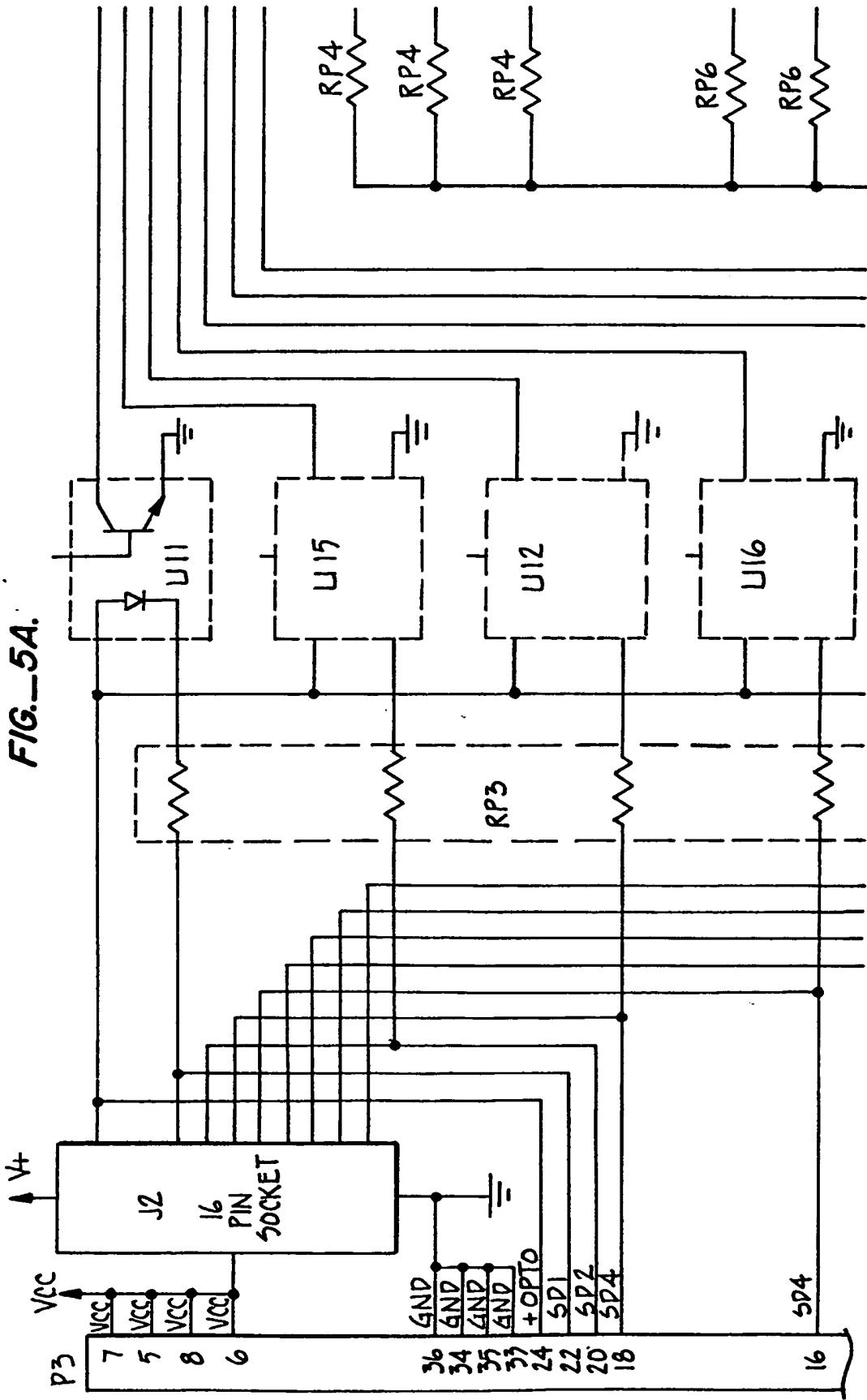


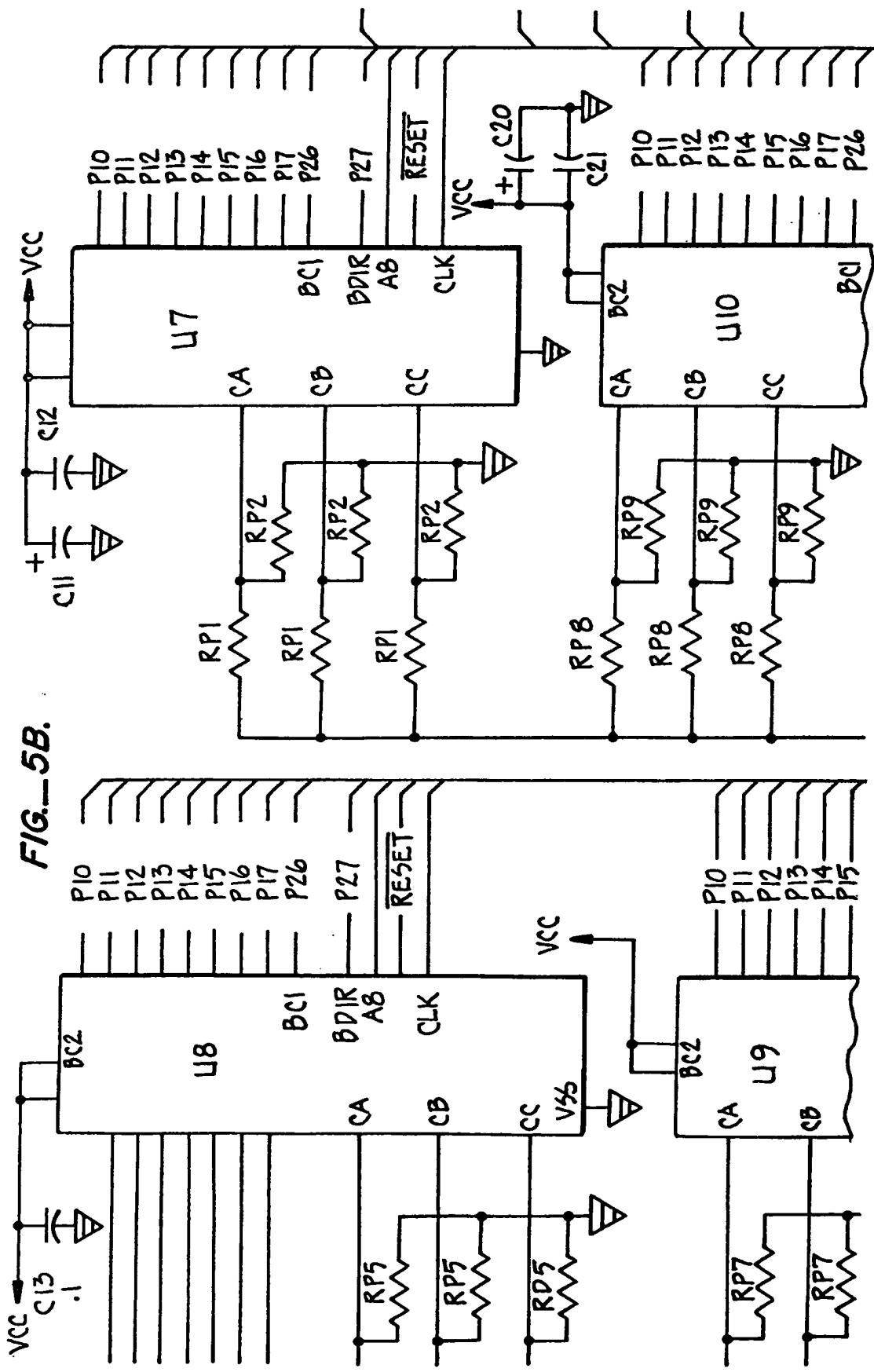
FIG.—4F.

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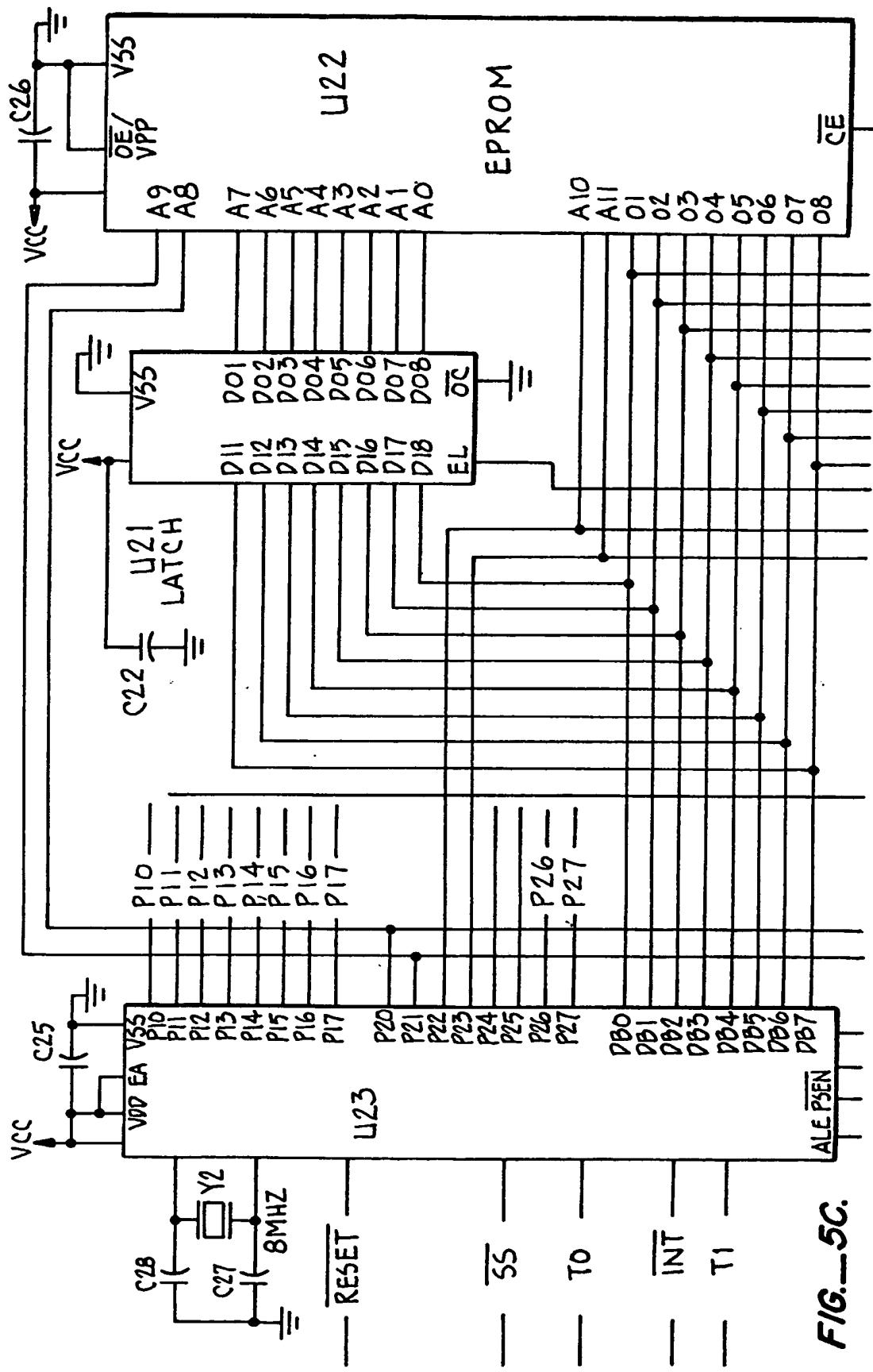
FIG. - 5A.



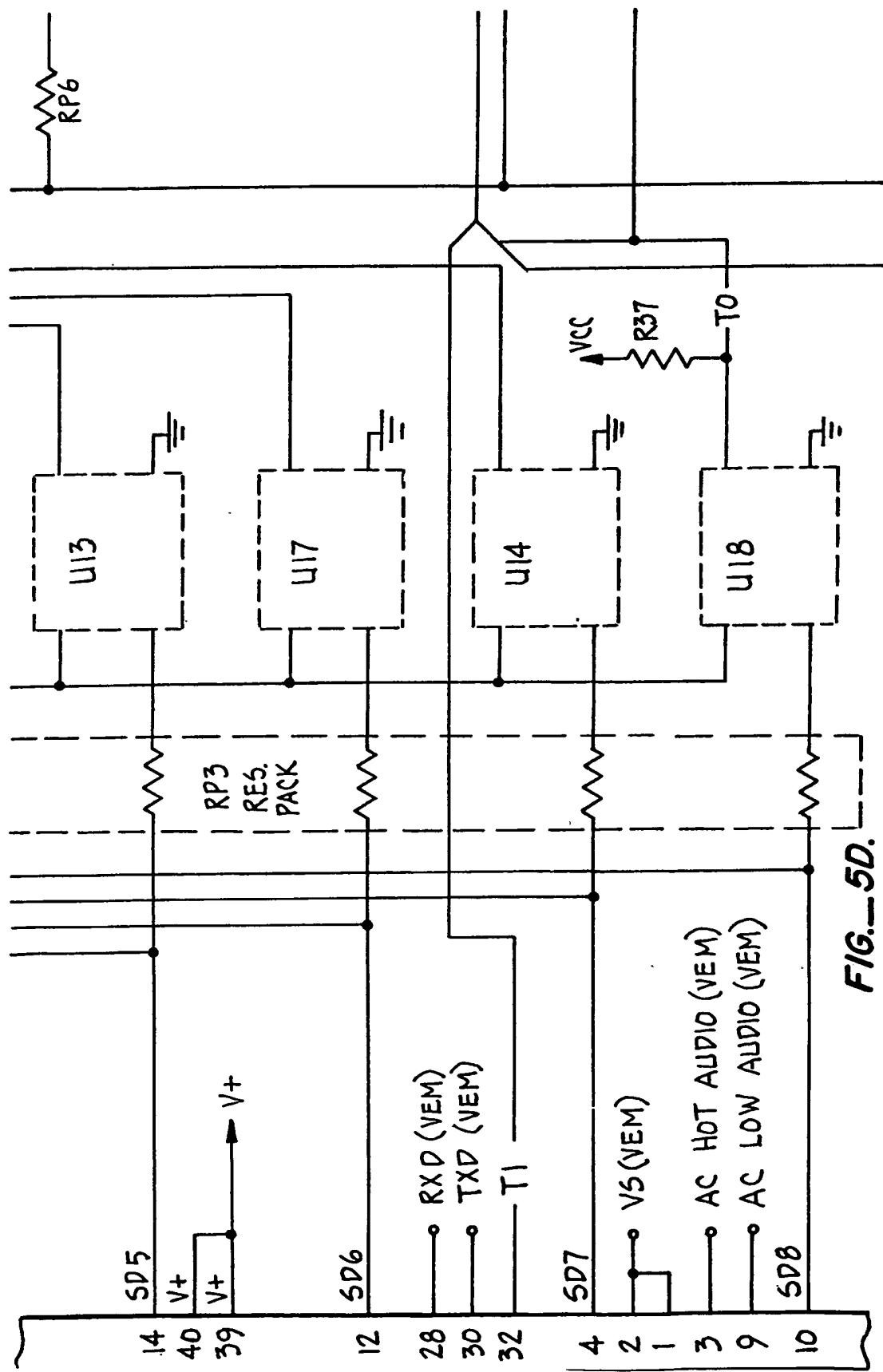
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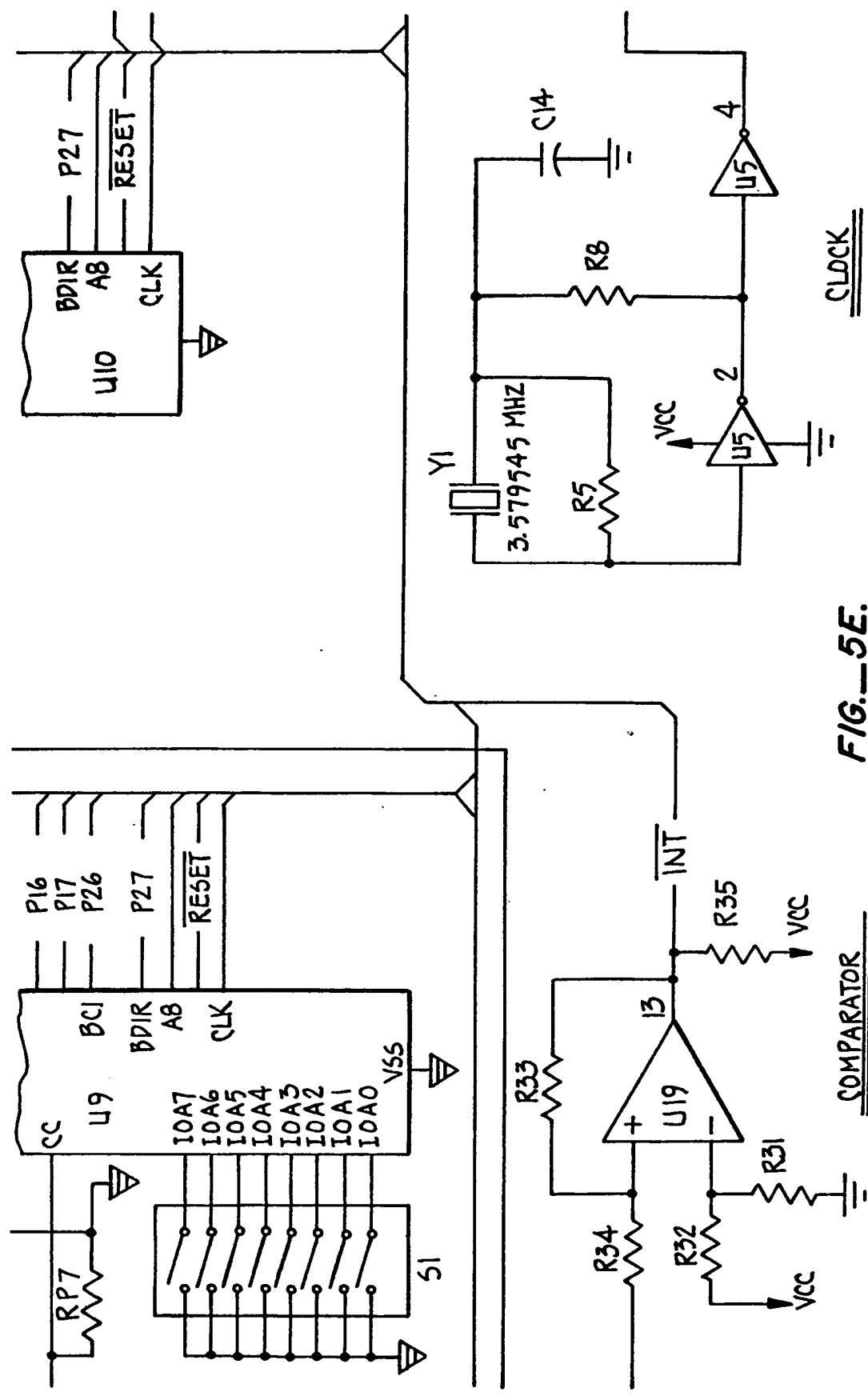
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F/G.—5E.

COMPARATOR

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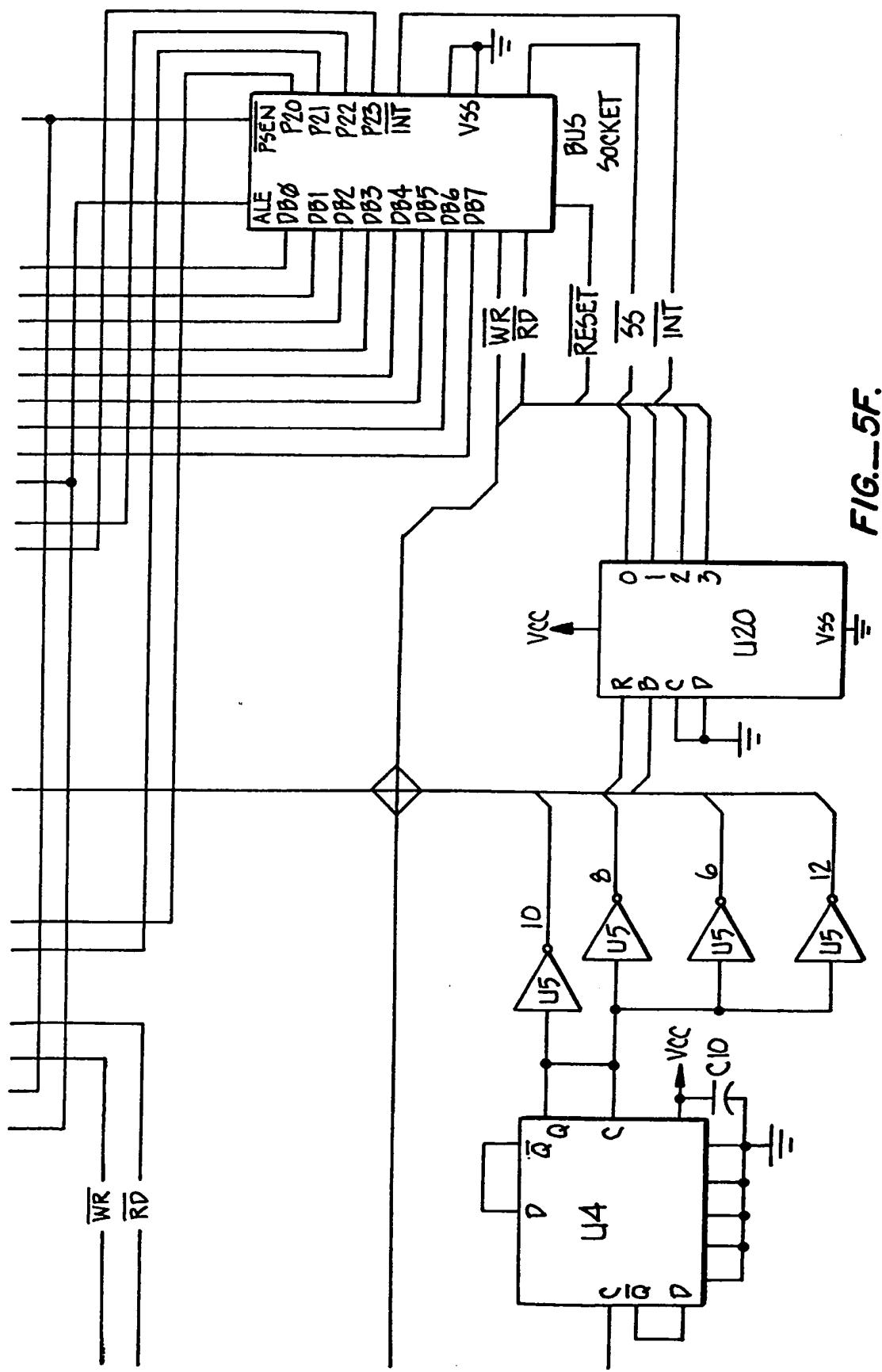
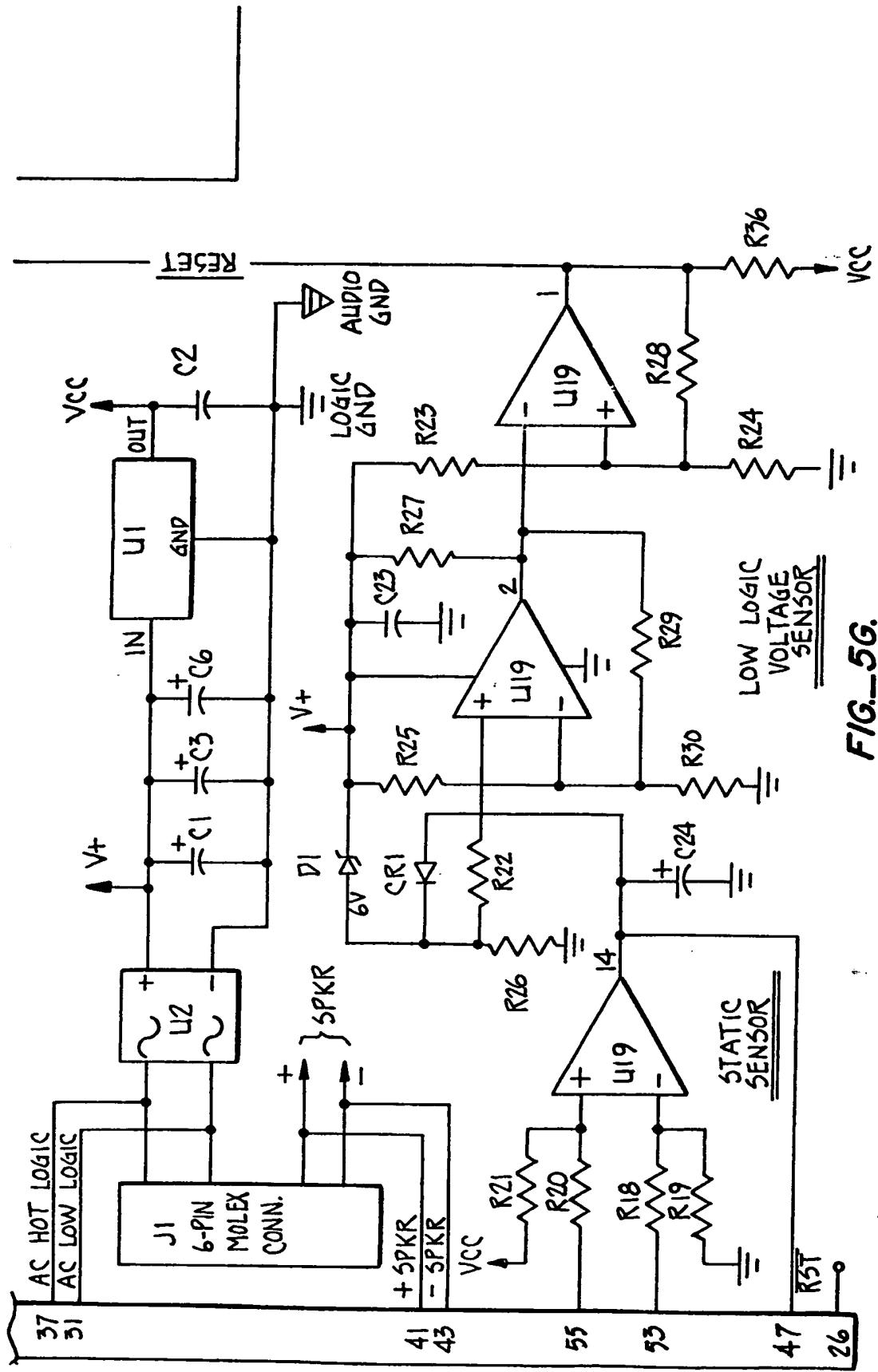


FIG.—5F.

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F/G_5G.

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FIG. 5A.	FIG. 5B.	FIG. 5C.
FIG. 5D.	FIG. 5E.	FIG. 5F.
FIG. 5G.	FIG. 5H.	

FIG. 5.

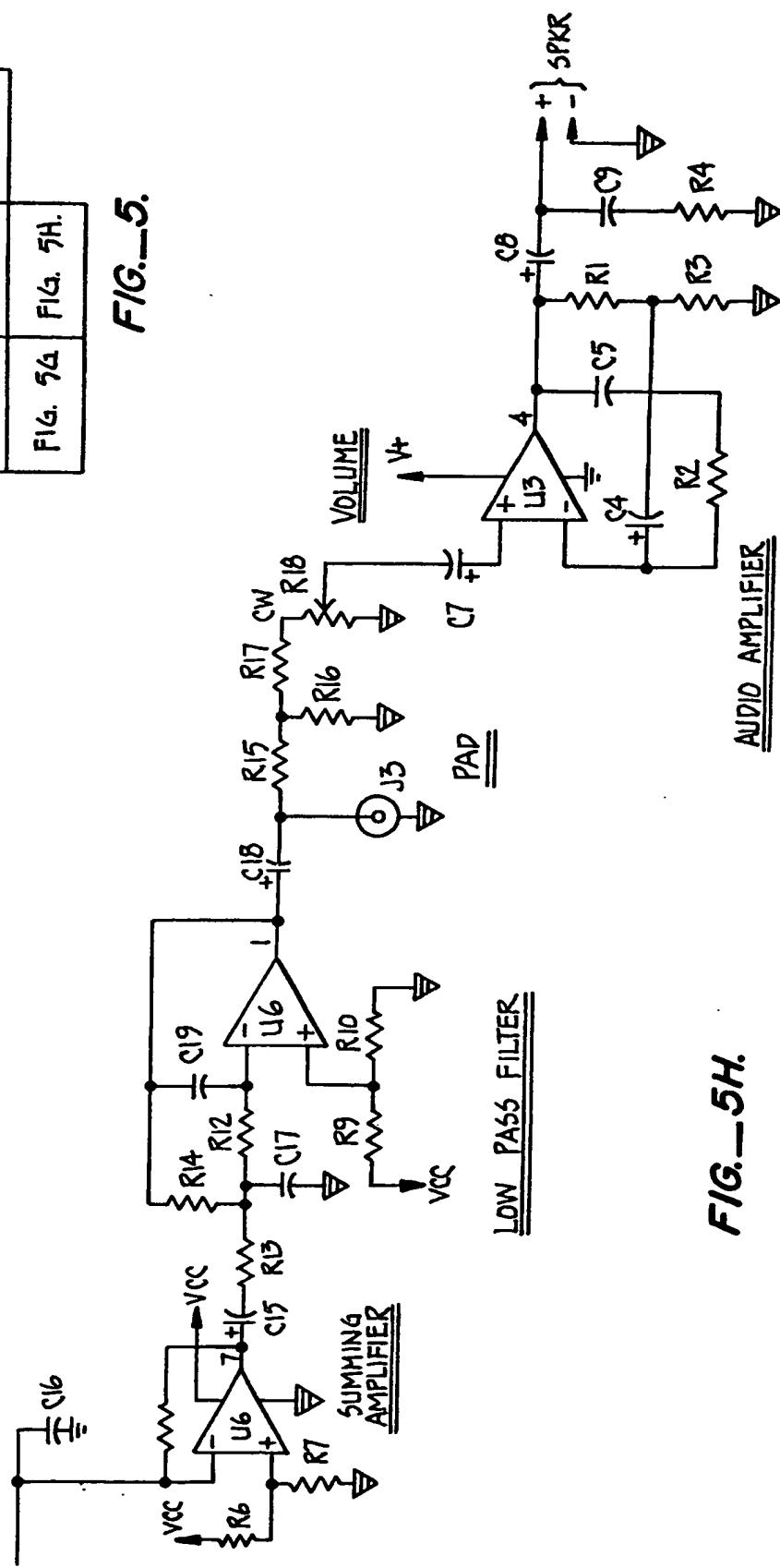


FIG. 5H.

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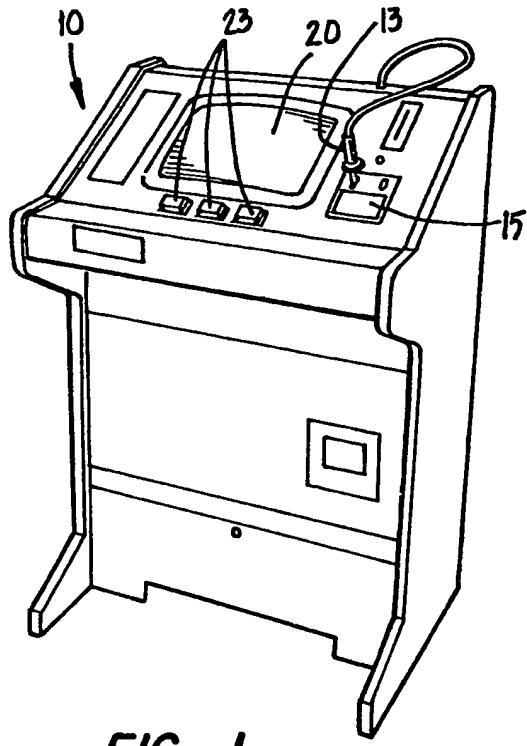


FIG.—1.

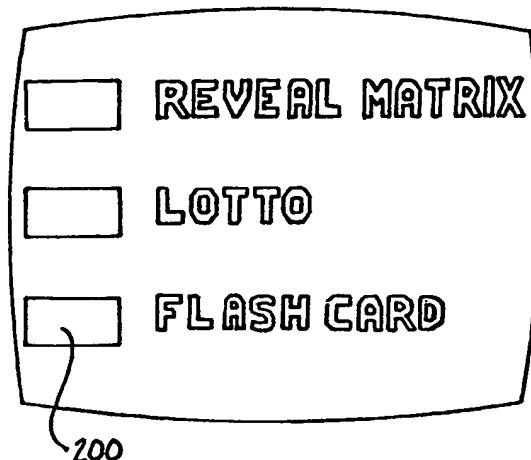


FIG.—6.

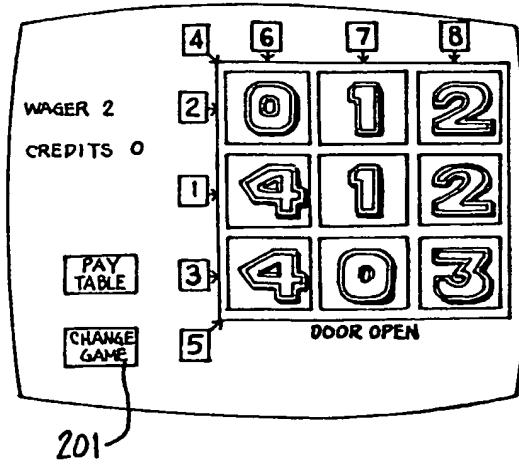


FIG.—7A.

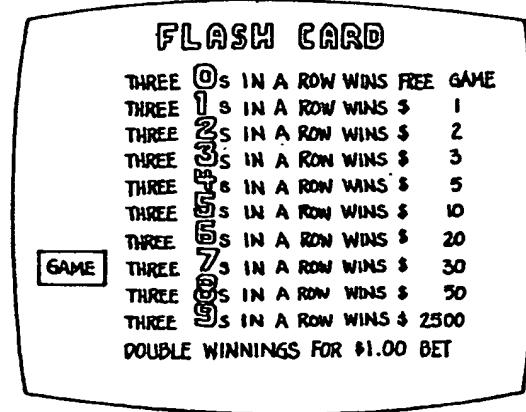


FIG.—7B.

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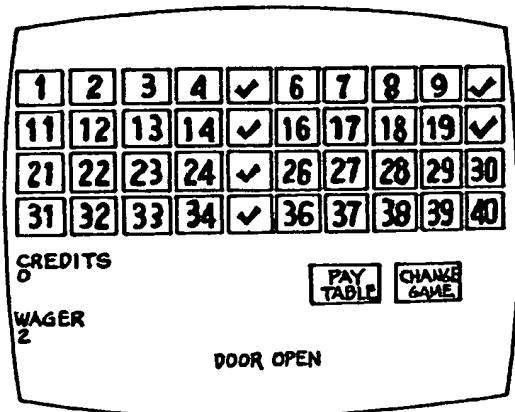


FIG. 8A.

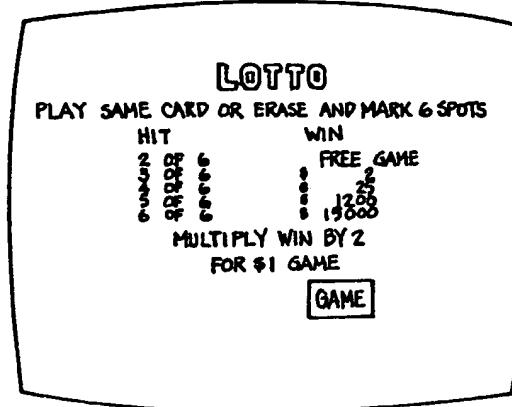


FIG. 8B.

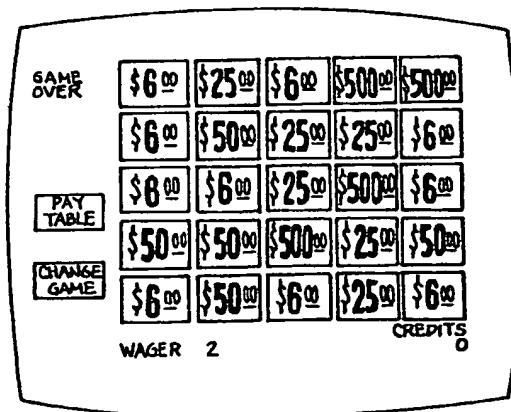


FIG. 9A.

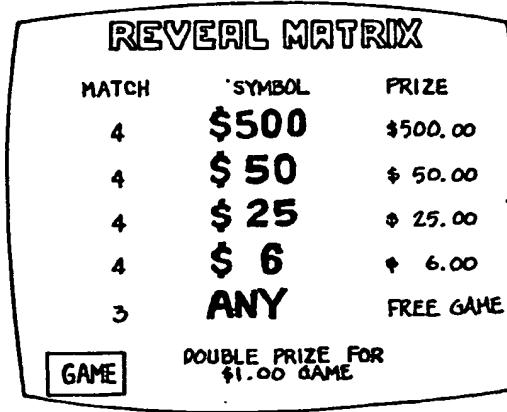


FIG. 9B.

SPECIFICATION**Lottery game terminal**

5 The present invention relates to electronic gaming devices. More particularly, the present invention relates to an electronic lottery game terminal for use in a lottery system, such as a state-supported lottery. 5

2. Description of the prior art

State run lotteries are well known and popular revenue raising enterprises. Such lotteries are benign forms 10 of taxation that allow a lottery ticket purchaser to buy a chance to win a large cash prize. In exchange for this legalized gambling, the state makes a favorable profit running the lottery. 10

Most lotteries involve the sale of a ticket that may be either an instant winner or scratch-off type ticket, wherein the purchaser reveals an obscured number pattern in a matrix to determine on the spot if he is a 15 winner; or a large jackpot type ticket, wherein the purchaser awaits selection and posting of winning ticket numbers, usually after an announced "drawing". 15

In all such state run lotteries, the purchase of a ticket is a vendor/vendee type transaction. That is, a purchaser goes to a ticket agent, purchases a ticket, and either scratches off a ticket coating which obscures the value of the ticket, or awaits the posting of a list of winning ticket numbers. In all such cases, there is no real game play involved in "playing" the lottery. Additionally, gameplay accounting and security are poorly supervised. As a result, it is not uncommon for ticket agents and game players to conspire to cheat the lottery. Nor is it unusual for forged lottery tickets to be presented to collect a prize. 20

Summary of the invention

The present invention provides a lottery game terminal either for use as a stand-alone unit or for use in a 25 statewide lottery network. The lottery game terminal provides a game player with a choice of several lottery type games. Game selection is made by light pen selection of any one of several soft switches provided on a game terminal display main menu. Soft switches enable the player to select between a game display and an associated game pay schedule. Game play is also directed by a series of light pen operated soft display 25 switches.

30 The lottery game terminal consists of the following modular components: a microprocessor; input/output circuitry; a tone generator; a printer and printer interface; and a color monitor. The microprocessor is the central control for the entire lottery game terminal. The microprocessor is a dual CPU circuit including a game processor for overseeing game, accounting, and input/output functions; and a video processor, for controlling game display functions. 30

35 Serial communication between the microprocessor and game components such as switches, sensors, detectors, and meters, is a function of serial communications via the input/output circuit. Thus, the tone generator, and printer and printer interface are coupled to the microprocessor via the input/output circuitry. 35

A separate serial link is provided directly to the microprocessor for coupling the lottery game terminal in parallel with other lottery game terminals in a lottery game system. In such arrangement, circuitry within the 40 lottery game terminal allows it to be uniquely identified. 40

A light pen interface and color monitor operating circuitry are included as part of the video processor portion of the microprocessor. Video processor display images are formed from a plurality of image element character blocks stored in addressable character memory and displayed in a series of movable display planes. 45

45 It is a novel feature of the present invention that a lottery game terminal is provided for inclusion in a statewide lottery system. The lottery game terminal provides the game player with a plurality of selectable games designed to maintain player interest and to appeal to a broad player base. Novel circuit architecture provides high resolution color graphics and realistic sound effects to accompany game play and thus enhance the player's enjoyment. Lottery game terminal communications within a lottery system are 50 encrypted to provide a high measure of security. Additionally, high-tier wins may require remote validation to ensure payment of valid wins only, and thus discourage cheating of the lottery game system. 50

Other security measures include a full complement of solid state and mechanical meters for storing game play statistical information and a complete battery backup system for maintaining game memory data intact. To this end, the game terminal architecture is that of a state machine wherein game play and operation is a 55 function of a number of defined game states. Thus, game interruption - e.g. due to power failure - does not effect game play because previous game states are remembered and game play may continue at said states when game play is restored after the interruption is corrected. 55

Brief description of the drawings

60 *Figure 1* is a perspective view showing a lottery game terminal according to the present invention; *Figure 2* is a block diagram of the lottery game terminal circuit; *Figure 3* is a schematic diagram of the lottery game terminal microprocessor circuit; *Figure 4* is a schematic diagram of the lottery game terminal interface circuit; *Figure 5* is a schematic diagram of the lottery game terminal tone generator circuit; *Figure 6* is an illustration of the lottery game terminal display showing a series of user selected lottery 60

65 65

- games;
- Figure 7A is an illustration of the lottery game terminal display showing a flash card type game;
- Figure 7B is an illustration of the lottery game terminal display showing the flash card type game pay schedule;
- 5 Figure 8A is an illustration of the lottery game terminal display showing a lotto type game; Figure 8B is an illustration of the lottery game terminal display showing the lotto type game pay schedule;
- Figure 9A is an illustration of the lottery game terminal display showing a reveal matrix type game; and
- Figure 9B is an illustration of the lottery game terminal display showing the reveal matrix type game pay schedule.
- 10 **Detailed description of a preferred embodiment**
- A preferred embodiment of a lottery game terminal 10 is shown in perspective view in Figure 1. Terminal 10 includes a light pen 13, a color video monitor 20, and a series of input switches 23, by which various game terminal operations are performed. Although a color monitor is disclosed herein, other types of displays may 15 be provided in its place, such as black and white monitors, plasma panels, and liquid crystal displays.
- Terminal 10 also includes a coin slot 15. A player initiates game operation by inserting various denominations of coins into slot 15. The denomination inserted depends on the type of operation desired for the particular game being played.
- Figure 2 is a block diagram of a preferred lottery game terminal circuit. The game terminal circuit includes 20 five basic modules:
- 1) a microprocessor module 12;
- 2) an input/output module 14;
- 3) a tone generator module 16;
- 25 4) a printer interface module 18; and
- 5) a color monitor 20.
- Microprocessor module 12 is the central control for the entire lottery game terminal. The microprocessor module is of a dual CPU architecture and is accordingly under control of a game processor 34 and a video 30 processor 37. Each of the two processors manages a separate game terminal function, thereby providing improved system performance and integrity.
- Game processor 34 produces the signals necessary to communicate with all external modules except color monitor 20. The external modules control such items as input switches 23; various sensor inputs, such as a "door open" detector 22; meters 27; various game operation solenoids (not shown); game lamps 26; tone 35 generator module 16 including its associated speaker 17; printer interface 18, including its associated printer 19 and paper cut mechanism 21; and serial communications channels to a lottery agent terminal 11. Game microprocessor 34 also controls game execution. Accordingly, game processor 34 supervises all decoding, command instructions, and data flow in the lottery game terminal circuit.
- Game processor 34 includes a serial link to the lottery agent terminal, as described above. The present 40 lottery game terminal is intended for use either as a stand-alone game or in a lottery gaming system. The preferred embodiment of the invention provides a plurality of lottery game terminals coupled in parallel on a serial bus and in communication with a lottery agent terminal. Each terminal in such a lottery gaming system is uniquely identified by a hardware and/or software ID tag, discussed below.
- A video lottery system with which a preferred embodiment of the present invention may be used is the 45 subject of pending patent application 8423031 (Agents Ref 15071A) entitled "Video Lottery System". The lottery system disclosed therein was invented by the inventors herein and is assigned to the assignee of the present invention, IGT Corporation of Reno, Nevada. The above-mentioned pending patent application is not considered essential to an understanding of the present invention, but is included to orient the reader to the type of lottery system with which the present invention can be used.
- 50 I/O module 14 handles the transfer of information between the various input/output devices and microprocessor module 12. I/O module 14 includes an input buffer 28, an input shift register 29, an output shift register 30 and an output drive register 31. Because communication between I/O module 14 and microprocessor module 12 is serial, there is a high degree of I/O flexibility. As a result various types of game play are provided by the present invention.
- 55 The following is an exemplary list of the output devices connected to I/O module output shift register 30 via output drive register 31 that are under control of game processor 34:
- 1) Printer interface module 18 - transfers ASCII commands in characters; printer 19 may be provided with a unique and controlled paper stock and proprietary printer font as a security measure.
- 2) Tone generator module 16 - transfers sound commands.
- 60 3) Lockout solenoids (diverters lockout) - controls passage of coins through acceptors (slots) 15.
- 4) Meters 27 - electrically and mechanically providing number-of-games, credits won, high tier win, credits played, and cash box meter indications.
- 5) Lamps 26 (indicators) - error lamps (door open and malfunction), switch lamps (depending on games), and optical door-open emitter,
- 65 6) Optical "door open" detector 25 - part of door-open sensor; detects entries into the game terminal

- cabinet.
- The following is an exemplary list of input devices connected via I/O module input buffer 28 to input shift register 29 that are under control, and that produce actuating input signals for game processor 34:
- 1) Optical "coin in" detectors 22 - produce a valid coin-in signal after coin falls past optical sensors; can also detect coin travel direction; typically includes antistringing and slugging detectors to provide a high degree of game security. 5
 - 2) Input switches 23 and option switches 24 (depending on game).
 - 3) Printer interface module 18 - transfers status/error characters from printer 19.
- I/O module 14 provides a serial interface function to couple terminal input and output signals between microprocessor module 12 and various game I/O modules and devices. The I/O signals are optically coupled to I/O module 14 and from I/O module 14 to microprocessor module 12, to eliminate noise carried by conventional circuit wiring. Reliability and security are therefore hallmark features of the present lottery game terminal. 10
- I/O module 14 is coupled to game processor 34 via an I/O control circuit 32, which is a bidirectional serial/parallel shift register. Game processor 34 includes a serial communication port which furnishes a data acquisition system communication point for data exchange between the lottery game terminal and either lottery agent terminal 11 or a lottery system control computer (not shown). A dual communications port 36 is provided as a peripheral device by which data are transmitted between game processor 34 and video processor 37. 15
- 20 A watchdog circuit 33 monitors the running of a control program in game processor 34. Watchdog circuit 33 is a safety circuit that is included to prevent false processing of program data. Any deviation of program selections, such as erroneous timing due to static or component failure, causes termination of game operation.
- A CMOS memory module 35 provides game processor 34 with a nonvolatile memory to maintain meter, 25 game summary, and status information. CMOS memory module 35 has separate battery powered retention and back-up battery failure detection circuits to safeguard memory-resident data in the case of power or equipment failure. An exemplary battery (not shown), such as a lithium battery, can maintain the data in the memory module more than six months in five years of continuous use. 25
- CMOS memory module 35 can also be removed from the microprocessor module during lottery game 30 terminal maintenance or replacement. CMOS memory module 35 can thereafter be replaced in new or remanufactured equipment while maintaining the meter information intact. An exemplary memory backup circuit may be provided by a "Look-Ahead State-Saving Device", which is the subject of pending patent application Serial No. 447,358, filed 6 December 1982, invented by Logan L. Pease and William Wells, and assigned to IGT Corporation of Reno, Nevada, the assignee of the present patent application. 30
- 35 Video processor 37 provides signals to select and display images on color monitor 20. Because color monitors are well known in the electrical arts, a circuit diagram of an exemplary monitor is not considered necessary for a complete, enabling disclosure of the present invention. Images formed by color monitor 20 are composed of image element character blocks represented in an addressable character memory 47. The image element character can be moved to any location on the video display screen area, held stationary, or 40 moved continuously. Video processor all video operations for the game in accordance with commands transmitted from game processor 34 via a dual communications port 36. Video processor 37 may be of the type described in pending patent application Serial No. 406,672, filed 9 August 1982, entitled "Video Processing Architecture", invented by Wesley F. Carmean, and assigned to the assignee of the present patent application, IGT Corporation of Reno, Nevada. 40
- 45 A cathode ray tube (CRT) control circuit 38 operates under video processor control and generates control and addressing signals for a character generator circuit 39 and also generates horizontal/vertical video synchronization signals for color monitor 20. Each image element character block is stored in character generator circuit 39 and addressed by character memory 47. Character memory 47 is loaded by video processor 37, which controls the makeup of images. Provision is also made within CRT control circuit 38 for 50 interfacing light pen 13. Light pen 13 provides an optical link between color display 20 and microprocessor module 12. The light pen has an armor shielded cable to prevent breakage due to misuse or vandalism. 50
- A plane color control circuit 40 mixes image element character blocks from character generator circuit 39 to make up each of the displayed image planes. The image planes can be moved continuously in any direction or held in a stationary position on color monitor 20. Plane color control circuit 40 also provides 55 color selection information to each of the displayed image planes. 55
- The assembled image, which consists of a composite of stationary and movable parts within the several displayed image planes, is provided to a digital-to-analog converter circuit 41. Digital information that comprises the game images is converted by the digital-to-analog converter circuit 41 to analog video signals corresponding to the signal components and representing the primary colors red, green, and blue. Video 60 signal information is coupled via an external connector (not shown) to color monitor 20. Horizontal and vertical synchronization pulses from CRT control circuit 38 are also coupled to color monitor 20 at this connector. 60
- Tone generator module 16 produces a wide range of sound effects in response to commands sent to it from microprocessor module 12 via I/O module 14. Input interface circuit 42 includes input optical isolators 65 to provide a unidirectional communication path between microprocessor module 12 and tone generator 65

module 16 having high immunity to noise. Such noise immunity is the result of electrical isolation of tone generator module 16 from I/O module 14.

A tone processor 43 operates under control of a program resident in a tone processor memory 44 to supervise the decoding, command instructions, and data flow in tone generator module 16. A programmable sound generator circuit 45 receives commands from tone processor 43 and produces selected audio signals in accordance therewith. Flexible programming capability allows a wide variety of sound effects and music to be produced with a single system. Audio power amplifier 46 amplifies audio produced by sound generator circuit 45 to drive loudspeaker 17. 5

Printer interface 18 controls a bidirectional communication link between game processor 34 and solenoid motor driver circuit 51. Solenoid motor driver circuit 51 activates printer 19 and paper cut mechanism 21. Printer interface 18 also activates a paper advance mechanism within printer 19 and detects a paper low condition. 10

Input/output buffer 48 is a bidirectional communication link between printer interface 18 and I/O module 14. Data input to printer interface 18 are in the form of ASCII characters and commands. Outputs from printer interface 18 are status and error bits for detecting problems occurring during otherwise normal operating conditions. 15

A printer processor control and character program resident in memory 50 provides operating instructions for printer interface processor 49, which in turn supervises all decoding, command instructions, and data flow in printer interface 18. In case of power failure, a power detect circuit associated with printer interface processor 49 maintains processor integrity by providing failure detection messages to microprocessor module 12. 20

Solenoid power source for activating stepper motors (not shown) within a print head driver and solenoids (not shown) within the printer and the paper cut mechanism. Printer sensor (paper low, etc.) and paper cutter sensor outputs are routed through a sensor buffer circuit 52 to printer interface processor 49. The specific mechanical structure of the printer is not shown herein. The mechanical aspects of printers are well known in the mechanical arts - a discussion of these aspects in this patent application is not considered necessary to provide a complete enabling disclosure of the invention. 25

Figure 3 is a schematic diagram of an exemplary microprocessor module. Table 1 provides a list of industry standard components that may be used in an exemplary embodiment of the invention constructed according to the circuit disclosed in Figures 3-5. Game processor U39 operates in accordance with program instructions stored in ROM memory U36/U37. Communications between the microprocessor module and the other modules in the circuit are via optoisolators U3/U11-U15. Communications with video processor 37 are via dual communications port 37, which is comprised of latches U52/U53. Game microprocessor U39 also includes a half duplex serial data line for two-way communication with an agent terminal in a lottery system. A plurality of lottery game terminals are provided in the exemplary embodiment of the invention. Each lottery game terminal is connected to the serial bus in parallel with the other lottery game terminals. An agent terminal or central computer addresses a selected one of the lottery game terminals by sending a unique header message which may be hardware or software detected only by the addressed lottery game terminal. Thus, the first data word shifted to the data bus from shift register U40 is only recognized by a particular lottery game terminal. In other embodiments of the invention, a hardware decoder and latch circuit (such as circuit 11a shown in Figure 2B) may be set when a unique switch-selected data word is received at the addressed lottery game terminal. 30 35 40

TABLE 1

Exemplary components listing

5	<i>Identifier</i>	<i>Figure</i>	<i>Industry designation</i>	5
	U2/U3/U11-U15	3	GN139	
	U10		2003	
10	U16/U41		74LS04	10
	U22		LM3302	
	U23		4584	
	U24		74LS138	
	U25		74LS193	
15	U26	4098		15
	U28	4040		
	U29	4027		
	U36/U37		2764	
	U38		74LS373	
20	U39	8051		20
	U40	4094		
	U42	4021		
	U52/53		74NC374	
	U54		74LS32	
25	U57		74LS74	25
	U87		LM338	
	U1/U3/U11/U19/U32/U43	4	2003	
	U2/U35/U36/U41		4021	
30	U4-U6/U9/U10/U12/			30
	U16-U18/U20/U24/			
	U26/U29/U33/U34/			
	U37/U38/U40		H11A1	
	U8/U15/U23/U30/U39		4094	
35	U21/U22/U27/U28		14584	35
	U1	5	LM323	
	U2		MDAA970	
	U3		TDA2002V	
40	U4		MC14013	40
	U5		4096	
	U6		LM324	
	U7-U10		8912	
	U12-U18		H11A1	
45	U19		LM3302	45
	U20		MC14028	
	U21		74LS373	
	U22		2732A	
	U23		8039	
50				50

- Figure 4 is a schematic diagram of a lottery game terminal interface module. The diagram shows a plurality of latches that are addressable according to a decoded memory address present at decoder U2. When addressed, each latch produces an output signal indicative of a signal condition at the latches input. Accordingly, optoisolated output signals are provided to operate various lottery game terminal features.
- 5 Some such operation is the result of address and data information provided by the microprocessor module. Other such control is a function of combinational logic in the interface module itself. The interface module also provides a data bus which couples the microprocessor module to the tone generator module. 5
- Figure 5 is a schematic diagram of an exemplary tone generator module. Data from the interface module is coupled to the tone generator module by means of optoisolators U12-U18. A sound generator circuit U7-U10 10 produces tones in accordance with data supplied from the interface module and under the control of a central processing unit U23. The CPU operates the sound generator circuit to generate these tones in accordance with tone program instructions stored in EPROM U22. Signals output from tone generator U7-U10 are mixed at a summing amplifier U6-U7, filtered by low pass filter U6-1, and amplified for reproduction by speaker at a cabinet mounted amplifier U3-4. Various switches S1 are included that may be 15 set to preprogram certain sound effects. 15
- Lottery game terminal packaging provides modular construction such that all assemblies can be easily removed or replaced for field service. The major assemblies packaged in lottery game terminal (as shown in Figure 1) include the following:
- 1) Monitor Assembly - the monitor assembly contains a shielded color monitor 20 having four-way 20 mechanical adjustment of viewing angle. A card cage assembly (not shown) is provided in a locking container to house microprocessor module 12, I/O module 14, and tone generator module 16. A power assembly (not shown) is also provided which contains a transformer, line filter fuses, circuit breaker, and line switch. A printer assembly includes printer 19, printer interface 18, paper, paper cut mechanism 21, and a paper holder. 20
- 25 2) Coin Handlers - coin handling is aided by use of electronic acceptors - preadjusted assemblies that sense metallic content and size of coin for acceptance.
- 3) "Coin In" Detector - coin-in detector 22 is an optical into the lottery game terminal to initiate game play. A holding cup (not shown) is provided to hold these coins until the game is started by player or coin reject switch selection. If coin reject switch operation is sensed, the coins are returned to the player. If the player 30 starts the game, the coins are diverted to the drop box. It should be appreciated that some of the elements and components relating to the present invention are not shown in the figures herein or are not discussed in detail. Those elements and components are considered to be well known in the art and, at any rate, not essential to an understanding of the invention and are not elements or components of the invention itself at the point of novelty. 30
- 35 All assemblies can be accessed at front and top portions of the lottery game terminal. This arrangement expedites service and maintenance activities. Various lamps within the lottery game terminal include a service lamp; a convenience outlet is also provided. Printer paper is accessed by opening a top portion of the lottery game terminal. 35
- Security enhancements to the present invention include a recessed connector housing (not shown) to 40 protect connectors and cables. The connector housing is water tight and therefore resistant to damage resulting from spilled beverages. A two-stage error indicator lamp (one of lamps 26) is mounted at a top portion of the lottery game terminal to indicate game door open and game malfunction. A flange around the door frame prevents unauthorized entry into the game cabinet. Optical door open detector 25 detects if the door is unlocked and/or opened and produces an actuating signal in response thereto. 40
- 45 Lottery game terminal security measures include a metal lined cabinet, stages multi-key cabinet entry, and electronic coin acceptors having anti-stringing and anti-slugging measures which include an agent alarm. Also included is a last game recall to help resolve game result disputes and static and RFI protection circuits. 45
- The lottery game terminal reports maintenance problems and security violations to a central computer through a serial link with the agent terminal. A separate memory section is provided having keyed entry 50 (agents do not have key to this compartment) and electronic door open detection. There is a continuous self testing of memory and provision for external memory verification. 50
- Game program software is resident in the game terminal, rather than being down-line loaded. In this way, the possibility of reprogramming a game terminal or intercepting a game program is eliminated. The game includes a secure coin container, having a heavy duty door and separate keyed entry. Power-down and surge 55 protection is provided, and an optical door open condition reporting circuit is also provided. Memory is battery backed-up and may be removed to prevent tampering during a maintenance routine. Additionally, the printer uses a unique paper stock that is subject to state lottery control and upon which characters are printed according to a proprietary printer font that is not readily duplicated. 55
- Game states are described here to aid in explaining the various functions of the games. Fixed states are 60 described for all games because this approach simplifies a supervisor software program considerably and allows the supervisor program to perform nearly all game-independent functions. The first eight states (0-7) are reserved for the supervisor program. The remaining states are assigned by the game-dependent code as desired. 60
- State 0 is the idle state, although state 0 also includes all of the following functions:
- 65 1. Sees that the remote agent terminal is operational and locks out the game if it isn't. 65

2. Enables the coin lockout(s) if no credits are available for play.
3. Monitors the coin detectors and play credit switch, and goes to state 1 when a coin is inserted or a credit is bet. Monitors the meter display switch and performs the related displays. (Display meters is a separate function called by state 0, not an integral part of it.)
- 5 4. Monitors the light pen position and switches between game display and the pay table as requested by the player. 5
5. Switches among the four games if the player selects the "change game" soft switch on the screen.
6. Monitors the cash out switch and goes to state 7 to print a ticket (or cash out for gaming machines) when it is pressed.
- 10 7. Performs the "attract mode" functions (switching from game to game displaying "last game" and "pay table" for each game) after no play has taken place for one minute. 10
- The game is in state 1 whenever the current wager (credits plus coins) is non-zero and less than the maximum bet for the game currently selected. Pressing the coin reject switch returns all coins in escrow (coins deposited by the player for the current game). If no credits were bet before inserting the coin(s) that 15 were returned, then the game reverts to state 0. If credits have been bet, the coins cannot be returned and the player must play the game. 15
- Game-dependent code is called periodically to allow the game to select numbers, start the game, etc. The game may be started from state 1 (providing the bet is even and the correct number of squares have been selected.) This is to allow for additional coin(s) after the lockout(s) are disabled.
- 20 20 The game is in state 2 whenever the maximum bet is made but before the game is started. 20
- Game-dependent code may allow selection of numbers, etc. in this state. The lockout(s) are disabled. However, if additional coins are detected or if the coin reject button is pushed, the coins are returned as in state 1. This state monitors the start switch and the "start" soft switch.
- State 3 is the game accounting state. State 3 first waits 250 msec. in case an additional coin is detected. If 25 not, the coins that are in escrow are dumped into the drop and counted. The mechanical and CMOS RAM memory "games played" meters are incremented. The "last game" is saved for display in meter mode. (Game dependent code saves the necessary information in whatever state(s) is(are) most convenient for that game.) 25
- State 4 is the loser state. The video and sound processors are notified of the loss. State 5 is the winner 30 state. The video and sound processors are notified of the winner. If the amount won equals the wager (i.e. bet returned) then this is considered a "free game" and no credits are awarded. The video processor displays "free game" and the game processor turns on the play credit lamp. When the play credit switch is pressed, control passes to state 2 where the free game progresses like any other game. (No credits were awarded and, since the first two states were bypassed, no credits have been played.) The free game cannot be cashed out 35 and switching to another game is not allowed until the free game has been played. If desired, other arrangements can be provided for handling free games. 35
- State 6 is the hand paid jackpot/high tier win state. This state gets control whenever a prize over a certain amount is won. The credit meter is incremented while "HAND PAY CALL ATTENDANT" flashes on the screen. Then control is transferred to state 7.
- 40 40 State 7 is the cash out/print ticket state. This state gets control whenever the player elects to cash out. This state coordinates with the agent terminal (if provided), zeros the credit meter and prints the lottery ticket. States 6 and 7 may be combined in various ways for lottery applications. However, they are separate in the preferred embodiment of the invention to allow multiple gaming games in a single cabinet. 40
- All states above are never game-dependent. Generally, state 8 is the spin/shuffle/deal state and state 9 is 45 the evaluation state. However, any number of states may exist between state 3 and states 4-6. The supervisor in this instance gives control to state 8 when state 3 is done. 45
- There are a number of 4-byte meters in CMOS RAM memory in addition to five mechanical meters (not shown). Some CMOS RAM memory meters apply to totals for all games, and some apply to only the totals for one game.
- 50 50 The following CMOS RAM memory meters are provided for each of the games in the lottery game terminal: 50
1. COIN IN meter: This represents the total value of all coins played and sent to the drop. This number is the sum of the number of quarters plus four times the number of Susan B. Anthony dollars. The COIN IN mechanical meter is the sum of the four COIN IN CMOS RAM memory meters.
- 55 55 2. CREDITS WON/JACKPOTS meter: This meter records the total of all credits won for this game including high tier wins but excluding free games. The corresponding mechanical meter contains the total of the four CMOS RAM memory meters divided by 10. 55
3. CREDITS PLAYED meter: This meter records the total credits bet on this game, excluding free games. The corresponding mechanical meter contains the total of the four CMOS RAM memory meters.
- 60 60 4. There are ten GAMES PLAYED meters for each game. The first meter counts the number of games played with a \$.25 wager. The second meter counts the number of \$.50 games, etc. There are meters for wagers from \$.25 to \$2.50. Any combination of credits and coin totaling \$1.00 is recorded on the 4th meter. The grand total of all forty (4 x 10) GAMES PLAYED meters is recorded on the GAMES PLAYED mechanical meter. 60
- 65 65 5. FREE GAME meter: This meter contains the number of free games awarded by this game. 65

6. WINS meter: (Same as for gaming)
 7. LOSSES meter: (Same as for gaming)
- The following meters record exceptions and are not duplicated for each of the four games:
1. CASHOUT meter: This meter records the total amount cashed out (i.e. tickets printed). This meter represents all amounts in quarters, not dollars. The CASHOUT mechanical meter is the sum of the four CASHOUT CMOS RAM memory meters divided by 10. 5
 2. COIN IN TILT
 3. RESETS
 4. DOOR OPENS
- 10 5. SUSAN B. ANTHONY DOLLARS meter: This meter counts the number of Susan B. Anthony dollars played on the game. The only purpose of this meter is to show the relative popularity of Susan B. Anthony dollars. It is not needed for any accounting purposes and it has no corresponding mechanical meter. Internal RAM memory is allocated essentially as follows. All internal RAM locations are available for game-dependent use. Since all four games are using the same RAM locations for different purposes, the 15 memory locations cannot be preserved when a player switches games. The memory locations are preserved between states during the play of one game. 15
- External program memory (EPROMs) is allocated as follows:
1. 2000-32FF is for the supervisor program and library routines.
 2. 3300+ is for the game-dependent code for the four games. The supervisor/library and the four games 20 each occupy a different memory segment and are linked together accordingly. 20
- External CMOS RAM memory is allocated as follows:
1. 1000-10FF belongs to the supervisor. The library routines including the interrupt handlers also use this area. The four games read and write this area when necessary for communication with the supervisor or the library routines.
 2. 1100-11FF belongs to game #1. The game-dependent meters go here, along with last game information and anything else the game needs to store. Only game #1 can write into this area, except when all of CMOS RAM memory is cleared after a cold startup.
 3. 1200-12FF is for game #2. It is used the same way game #1 uses 1100-11FF.
 4. 1300-13FF is for game #3. It is used the same way #1 uses 1100-11FF.
- 30 5. 1400-14FF is for game #4. It is used the same way game #1 uses 1100-11FF. 30
6. 1500-15FF is available for any future use.
 7. 1600-16FF is used for communications with the agent terminal.
 8. 1700-17FF is the communications area for the video processor. This is the only area into which the video processor may write. The video processor can read any location in CMOS memory.
- 35 35 The supervisor and library routines are assembled using the following inputs:
1. MACRO file.
 2. EQUATE file.
 3. SUPERVISOR/LIBRARY code. This file contains all game-independent code including the library routines. It includes the majority of the code for all states except for the spin/shuffle/deal state and the 40 evaluation state. This file contains as many functions as possible to eliminate the need for duplication in four different games. This code calls the game-dependent code at the appropriate times to allow the individual games to operate according to their special functions. 40
- Each of the four games is assembled with the following inputs:
1. MACRO file as used for the supervisor.
 2. WHICH GAME file. This file consists of only one line. The line is "WHICH SET n", where "n" is the game number from 1 to 4. The value of WHICH is used by the equate file and the game-dependent code to decide where to allocate external CMOS RAM memory and external program memory. This is the ONLY hard-coded game identification for each game. 45
 3. EQUATE file as used for the supervisor.
- 50 4. GAME-DEPENDENT CODE. This file contains all of the code for the spin/shuffle/deal state and for the evaluation state. It also contains small subroutines for each of the other states and for special functions such as display meters, start up, etc. 50
- The above assemblies produce five object files that must be linked together to produce one loaded direct access file. All references among these files are resolved by the linker. No hard-coded addresses are used in 55 any of these files. However, all PUBLIC addresses in the game-dependent code appear at the beginning of the module and in the same order. This allows the supervisor to access all four games by adding a constant to the address for game #1. 55
- The following are subroutine entry points in the game-dependent code that may be called by the supervisor.
- 60 1. POWER UP
 2. STATE 0 (Called at beginning of state)
 3. STATE 0 (Called when the first coin/credit is played)
 4. STATE 1 (Called at beginning of state)
 5. STATE 1 (Constantly called during "wait for coin/start" loop) This subroutine must not take more than a 65 few msec. to execute. 65

6. STATE 2 (Called at beginning of state)
 7. STATE 2 (Constantly called during "wait for start" loop) This subroutine must not take more than a few msec. to execute.
 8. STATE 3
 5 9. STATE 4 5
 10. STATE 5
 11. STATE 6
 12. STATE 7
 13. COIN RETURN. This routine is called whenever the escrow is returned to the player.
- 10 The supervisor jumps to the following game-dependent entry points as needed: 10
 1. STATE 8 is given control after state 3 or after a reset during state 8. States 8, 9 and 10 may pass control to each other as required by the particular game.
 2. STATE 9 is given control after a reset in state 9.
 3. STATE 10 is given control after a reset in state 10.
- 15 4. LAST GAME display is done by game-dependent code. If there is an extra page of meters for a particular game, this entry point takes care of that also. 15
 5. SELF-TEST jumps to this entry point for game-dependent self-test functions. The FLASH-CARD "reel strip" is the only example of this function in the exemplary embodiment of the invention.
- The above entry points appear in the order listed for each game and are three bytes apart. Any entry points 20 that are not needed by game-dependent code contain a return, a jump to reset code, or whatever is appropriate.
- The following data tables/constants appear in the order indicated after the entry points for each game:
 1. PROMN. 8 ASCII bytes identifying the game (for display in meter mode).
 2. MAXBET. This byte is the maximum bet for this game. This is four (quarters) for all games in the 25 exemplary embodiment of the invention. However, this scheme allows for combining other games with different MAXBET values into the same lottery game terminal.
 3. MAXCO. Two bytes for the maximum pay without declaring a hand-paid jackpot/high-tier win.
 4. MAXCOH. Two bytes (HEX) for the maximum cash-out without declaring a hand-paid jackpot/high-tier win.
- 30 5. SOFTBL. This is a variable length table of two-byte entries. Each entry is the row and column location on the screen of the upper left corner of the soft switches used by the game. A byte with a value of -1 signals the end of the table. The entries must be in the following order:
 1) Game-dependent switches if used
 2) ERASE (if used)
- 35 3) GAME 35
 4) PAY TABLE
 5) START GAME
 6) CHANGE GAME
 7) Terminator byte (-1)
- 40 The video processor uses one software assembly with multiple files to build all test strings and to define the screen locations for these strings. Most strings are common to all games, though their locations on the screen are usually different. This generalization applies to the "WINNER PAID", message, the tilt messages, and the self test and meter display messages. Other strings, including the pay table strings and the text of the traveler may vary from game to game. 40
- 45 The universal text file reserves space for the row and column for each string for each game. For example, if there are three games, then six bytes are reserved before the string for the row and column values. Subroutines have been added to the video library to display strings stored in this format. By setting a pointer to the first row-column pair, the subroutine uses the current game number to load the correct row/column values and then advance the pointer to the first byte of the string. This system is also used for soft switches 50 (light pen actuated display switches). A similar set of subroutines take care of four-byte entries like the row/column/attribute/length for the grower. 50
- A separate file is used to define the string data for each game. This file is divided into two basic sections. The first section defines the row/column locations for all universal strings used by that game. This section includes traveler, grower, soft switches, etc.
- 55 The second section is used to define all strings that are unique to a particular game. String handling is accomplished by small "front end" subroutines that deal with new row/column definitions. Some gaming video programs use two or more screen addresses for the same string. 55
- As for the game processor, there is a supervisor/library program and game program for each game. The supervisor/library takes care of power up, communication, self test, soft switches, tilts, meter display, and 60 the writing of universal strings the play of the game. The individual video programs for each game take care of writing and updating the "card", displaying the pay table, and any game dependent pages during self test or meter display. 60
- The text string assembly includes the following inputs:
 1. MACRO file.
 2. EQUATE file.
- 65 65

3. UNIVERSAL STRINGS file. This file contains the strings used by all games, including soft switch locations, traveler and grower texts, etc.
4. INDIVIDUAL GAME STRINGS files. These files contain the row column information for the universal strings, plus the game-dependent strings. There is no information in these files that indicates their game number. The order they are input to the assembler decides which one is game 1, etc. 5
- The supervisor and library routines are assembled using the following inputs:
1. MACRO file.
 2. EQUATE file.
 3. SUPERVISOR/LIBRARY code. This file contains all game-independent code including the library routines. This code calls the game-dependent code at the appropriate times to allow the individual games to operate according to special game functions. 10
- Each of the four games is assembled with the following inputs:
1. MACRO file.
 2. EQUATE file.
- 15 3. WHICH GAME file. This file consists of only one line. The line is "WHICH SET n", where "n" is the game number from 1 to 4. The value of WHICH is used to decide where to ORG the beginning of the module and which labels to declare as PUBLIC. This is the ONLY hard-coded game identification for each game.
4. GAME-DEPENDENT CODE. These files contain all game-dependent code including special strings and writing and updating the "card".
- 20 One game processor assembly produces PUBLIC declarations to which the video processor may link. No executable code is produced. This assembly includes the following files: 20
1. MACRO FILE
 2. GAME SIDE EQUATE FILE
 3. A 1-line file consisting of "WHICH SET 0"
- 25 4. Files defining all game-dependent RAM locations for each game. These files include PUBLIC statements for locations needed by the video. 25
5. A file with PUBLIC statements for all game-independent locations needed by the video.
- The above assemblies produce object files that must be linked together to produce one loaded direct access file. All references among these files are resolved by the linker. No hard-coded addresses are used in 30 any of these files. 30
- ALL PUBLIC addresses in the game-dependent code appear at the beginning of the module and in the same order. This allows the supervisor to access all four games by simply adding a constant to the address for game #1.
- The described game software codes and assemblies are included with this application as a microfiche 35 appendix to the application. The disclosure herein is considered sufficient to enable one skilled in the art to practice the present invention. The microfiche appendix is included to show exemplary game software - the software listing therein is not included as an exhaustive software listing. Accordingly, the scope of the invention should not be limited thereby. 35
- The games provided by the lottery game terminal invention have color graphics, animation, on-screen 40 player operating directions, and sound effects to attract, instruct, and inform game players. The audio-video components of the game add greatly to the realism, player involvement, and enjoyment of the video lottery game. Each game includes an attract mode, an information mode, a playing mode, and a collect winnings mode. In the exemplary embodiment of the invention, four different games are available for the player to choose from on each game terminal. These games are selected from a display menu (Figure 6) and include a 45 flash card type game (Figure 7), a lotto type game (Figure 8), a reveal matrix type game (Figure 9), and any one of other various games selected for inclusion in the terminal, such as a state landmark-type game (not shown). 45
- Players interact with the game through use of a light pen and push buttons, described above. Prizes are automatically accumulated and credited to a player until the player chooses to collect the outstanding prizes 50 or if the winnings exceed a predetermined high tier amount, for example, \$599. 50
- Light pen and "soft" push button menu driven interaction between the player and the game are provided because they are easy to use and more "user friendly" than a keyboard or joystick. A "soft" push button is a displayed indicium (e.g. square 200 in Figure 6 and square 201 in Figure 7A) which, when selected by a player with a light pen, produces a defined game event, such as initiating game play. When compared to a 55 touch screen, a light pen/"soft" push button game control mechanism is lower in cost and capable of more accurately selecting small areas of the video display, therefore providing higher resolution. More importantly, a light pen is far more reliable than a touch screen in actual lottery use. 55
- In the exemplary embodiment of the invention, lottery games are played in any of a number of coin denominations, for example, \$.50 or \$1.00. Game play is generated randomly and does not involve any 60 player skill. Thus, the game is a game of chance. The maximum prize awarded for any of the games is determined by a specific pay schedule for each game (Figures 7B-9B). Depending on the state lottery system used, the prize can range from a few thousand dollars to over a million dollars. Additionally, the prize can be paid in a lump sum or in installment payments. 60
- The choice of games provided with the present invention allows relatively uncomplicated game play while 65 providing a large degree of continuity with familiar scratch-off numbers games now in use. Additional 65

features, such as special drawings, wild symbols, doubling opportunities, bonuses, rollups, or progressives, can be incorporated in the present game terminal to increase excitement, stimulate sales, and expand a player base.

The games illustrated in Figures 7-9 are played as follows:

- The games illustrated in Figures 7A through 9A provide a known 9-block tic-tac-toe layout. Numbers ranging from zero to nine flash on and off in the nine blocks. The numbers are played at random. The frequency of each number is inversely proportional to its prize value. There are several prize levels. Matching three identical numbers in any row, column, or diagonal, wins a prize. An exemplary flash card type game display is illustrated in Figure 7A; an exemplary pay schedule for a flash card type game is illustrated in Figure 7B.

2) *Lotto* - a 40 block "Pick 6" video lottery game. The game provides an opportunity to increase on-line game play while piggybacking game advertising and promotions costs. Game play win is based on the number of matches. An exemplary lotto type game is illustrated in Figure 8A; an exemplary pay schedule for a lotto type game is shown in Figure 8B.

3) *Reveal Matrix* - a video match game where the player selects a number of blocks in a 25-block matrix. This game is analogous to the "scratch-off" type lottery game. Player selection of a block with the light pen in effect "scratches-off" an obscuring video display plane to reveal a number or value plane hidden beneath. As each block is selected, a prize denomination is disclosed. If a specified number of blocks match (for example, three) the player wins that prize. Once the game is over, all blocks are disclosed so the player can see how he could have played to maximize his winnings. The location of prize denominations changes at random every time the game is played. An exemplary reveal matrix type game is illustrated in Figure 9A; an exemplary pay schedule is for a reveal matrix type illustrated in Figure 9B.

4) *Landmark* - a 5-symbol game, dealt at random, where each symbol shows a state landmark of the state wherein the lottery is located. The number of matching symbols determines the prize, i.e., two of a kind, three of a kind, four of a kind, or five of a kind. The frequency of landmark symbols varies the prize value.

Other games that may be provided in the present lottery game terminal include non-skill adaptations to sporting and adventure themes, such as golf, tennis, soccer, hockey, car racing, and mountain climbing. Diversionary games can take advantage of common themes, such as puzzles and mazes. Luxury games can use status symbols, such as gold, diamonds, furs, travel, or expensive cars, and the game can be played for such potential prizes. These video games can be provided as daily and weekly games with delayed drawings to be played in addition to the games themselves. Thus, the present invention offers limitless opportunities to develop and perfect game themes, subject only to the requirements of the game program be changed to implement the new games in the terminal.

For example, the following are other types of games that may be incorporated in the present invention:

1) *Number Match* - a number matching game where players select a five, six, or seven digit number, one digit at a time, left to right. A random number program generates a number with a comparable number of digits to compare with the player's number. Prizes are awarded based on the number of digits that are matched in a sequence.

2) *Add-up* - a variation of the 25-block matrix with an add-up theme. Players select a specified number of blocks. Each block discloses a number. Players win prizes based on a total accumulated score for the blocks selected. The higher the score, the higher the prize. During game play, the numbers selected are automatically totalled on the screen.

3) *Horse Race* - a horse race game involving real horse names and likely odds. A random number generator determines winners.

4) *Amusement Variations* - versions of popular amusement games where players play the actual game for a short period, but win prizes on a nonskill random basis.

5) *Sports Team* - a sports game, with the correct seasonal theme (i.e., football, baseball, basketball). A number of real or fictitious teams are shown on the screen, along with their opponents. The player selects a winner in each game. The random program picks the winner in each contest. Prizes are paid based on the player's total number of correct choices.

The foregoing was given for purposes of illustration and example. It is contemplated that various equivalent embodiments of the present invention will be suggested by the disclosure herein. For example, other types of games may be played at the present lottery game terminal. Additionally, the game housing and security features may be augmented or dispensed with as required by the game site and application. Therefore, the scope of the invention should be limited only by the breadth of the claims.

CLAIMS

- 60 1. A game terminal, comprising:
a game processor for controlling operation of any selected one of a plurality of game terminal resident
games;
memory means, coupled for communication with said game processor, for storing and retrieving under
game processor control a plurality of game control programs, and an associated game-generated game
event audit trail;
65 a video processor, coupled for communication with said game processor, for assembling under game

- processor control a display image to accompany game operation;
 a light pen, coupled for communication with said game processor, for selecting a game to be played, and
 for directing game play and game terminal operation; and
 soft switch means in the form of light pen selectable indicia at predetermined display image locations, for
 5 effecting game selection, game play, and game terminal operation by setting said game processor to a
 corresponding game operation state, whereby player control of game selection, game play, and game
 terminal operation is provided. 5
2. The terminal of claim 1, further comprising display means, coupled to said video processor, for
 displaying said assembled display image and for displaying aid soft switch means indicium.
- 10 3. The terminal of claim 1, further comprising input/output means, coupled for communication with said
 game processor, for transferring signals between said game processor and a plurality of associated game
 terminal devices. 10
4. The terminal of claim 1, further comprising tone generator means coupled for communication with
 said game processor, for generating under game processor control selected sounds to accompany game
 15 operation. 15
5. A lottery game terminal, comprising:
 microprocessor means for controlling game operation including:
 a) game processor means for controlling operation of any selected one of a plurality of game terminal
 resident lottery games; and
- 20 b) a video processor, coupled for communication with said game processor for assembling under game
 processor control a display image to accompany said lottery game operation;
 memory means, coupled for communication with said game processor, for storing and retrieving under
 game processor control, a plurality of lottery game control programs and for storing and receiving under
 game processor control an associated game-generated lottery game event audit trail;
- 25 5. input/output means, coupled for communication with said microprocessor means, for transferring signals
 between said microprocessor means and a plurality of lottery game terminal associated devices;
 tone generator means, coupled for communication with said microprocessor means, for generating under
 game processor control selected sounds to accompany game operation;
 a light pen, coupled for communication with said microprocessor means, for selecting a lottery game to be
 30 played and for directing lottery game play and lottery game terminal operation; and
 soft which means in the form of light pen selectable indicia at predetermined display image locations for
 effecting lottery game selection, lottery game play, and lottery game terminal operation by setting said
 microprocessor means to a corresponding game operation state. 30
- 35 6. The terminal of claim 5, further comprising means coupled to said microprocessor means, for
 providing bidirectional communications between said terminal and a remotely located terminal supervisory
 system. 35
7. The terminal of claim 5, further comprising a plurality of sensor means, coupled to said
 microprocessor means via said input/output means, for providing accompanying signals corresponding to
 real time lottery game terminal events.
- 40 8. The terminal of claim 5, further comprising indicator means, coupled to said microprocessor means
 via said input/output means, for displaying lottery game events corresponding to a lottery game operation
 state. 40
9. The terminal of claim 5, further comprising meter means for storing and displaying game events and
 transactions.
- 45 10. The terminal of claim 5, further comprising a video display, coupled for communication with said
 microprocessor means, for displaying said assembled display image. 45
11. The terminal of claim 5, further comprising interface means, in communication with said
 micro-processor means via said input/output means, for coupling said terminal to a printer.
- 50 12. The terminal of claim 11, further comprising a printer coupled to said interface means.
 13. A lottery game system including a plurality of video lottery game terminals, each lottery game
 terminal comprising:
 a microprocessor module including:
 a) a game processor for controlling operation of any selected one of a plurality of game terminal resident
 lottery games;
- 55 b) a video processor for assembling a display image to accompany lottery game operation;
 c) a communications port for coupling said game processor to said video processor and over which game
 processor control signals are coupled to said video processor; and
 d) a bidirectional serial interface for coupling said lottery game terminal to said lottery game system;
 an input/output module, coupled to said microprocessor module, for transferring signals between said
- 60 60 microprocessor module and a plurality of associated lottery game terminal sensors and indicators;
 a tone generator module, coupled for communication with said microprocessor module, for generating
 under game processor control selected sounds to accompany game operation; and
 meter means for storing and displaying an audit trail of lottery game terminal events and transactions.
- 65 14. The terminal of claim 13, further comprising:
 a printer; and 65

- a printer interface module, coupled between said printer and said microprocessor module, for transferring data and control signals therebetween.
15. The terminal of claim 13, further comprising a video monitor, coupled to said video processor, for displaying said assembled display image; 5
- 5 said video processor including:
- a) means for generating under video processor control a video monitor vertical and horizontal synchronization signal;
 - b) means for storing and for generating under video processor control a plurality of image elements;
 - c) means for assembling under video processor control said image elements into a plurality of image 10 display planes; and
 - d) means for converting signals corresponding to said assembled display image into a video signal for operating said video monitor.
16. The terminal of claim 13, said microprocessor module further comprising means for uniquely identifying said lottery game terminal in a lottery game system by decoding a unique lottery game terminal 15 address provided to said lottery game terminal by said lottery game system. 15
17. In a microprocessor controlled lottery game terminal including a plurality of game terminal resident user selected lottery games, a method for playing a flash card type game, comprising:
- displaying a game matrix;
 - continuously displaying and changing a random series of elements displayed within said display matrix;
 - 20 selecting for static display a plurality of said elements at selected game matrix locations in any of a row, column, and diagonal configuration by means of a light pen;
 - declaring a winner when said selected display matrix locations contain matching elements; and
 - alternatively displaying upon selection thereof a game payout schedule.
18. In a microprocessor controlled lottery game terminal including a plurality of game terminal resident 25 user selected lottery games, a method for playing a lotto type game, comprising:
- displaying a game matrix;
 - selecting a plurality of disc game matrix locations in random sequence;
 - displaying an element at each selected location;
 - declaring a winner when a selected number of elements at said selected game matrix locations match; and
 - 30 alternatively displaying upon selection thereof a game payout schedule.
19. In a microprocessor controlled lottery game terminal including a plurality of game terminal resident user selected lottery games, a method for playing a reveal matrix type game, comprising:
- displaying a game matrix;
 - selecting a plurality of game matrix locations with a light pen;
 - 35 revealing an element associated with each selected location;
 - declaring a winner when a selected number of elements at selected matrix locations match;
 - disclosing elements contained at each location in the matrix upon conclusion of game play;
 - randomly changing element location within said matrix; and
 - alternatively displaying upon selection thereof a game payout schedule.
- 40 20. A terminal substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings. 40